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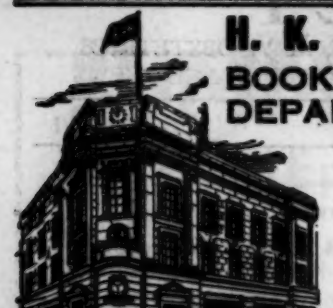

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## EXPERIMENTS ON MAN*

BY J. BARCROFT, C.B.E., M.A., F.R.S.
PROFESSOR OF PHYSIOLOGY, CAMBRIDGE UNIVERSITY

WHEN I was honoured with an invitation to give the Stephen Paget memorial lecture, that invitation was coupled with a request that I should take as a subject "Experiments on Man," but, perhaps unfortunately, it was left to me to interpret that phrase. Two possible interpretations I have put on one side, the first is sociological; it would be possible under the title of experiments on man to treat of one of the most interesting and important types of experiment, that which subjects groups of persons to certain altered sociological conditions. Having regard, however, to the memory of Stephen Paget and to the particular cause to which he devoted his life, I conceive that in the present connexion some more individual type of experiment was in the minds of those who asked me to lecture. On the other hand, I could treat of experiments, such as the classical one of Fick and Wislicenus, which while extremely informing were quite unattended by any particular risk to the subjects, and indeed may have formed an entirely pleasurable excursion. I have in the main set such aside also, and for the same reason—namely, that Stephen Paget's devoted labours had to do with experiments which, though not necessarily painful, were conducted under an Act of Parliament designed to secure the conscience of the nation against the suggestion that it tolerates wanton cruelty within its borders. The researches of which I shall treat to-day are on men, but are such that they would have to be conducted under the Act 39 & 40 Vict. of 1876 were man regarded as being a "vertebrate" in the sense of that Act. And in particular I wish to treat of a certain aspect of this subject—namely, the answer to the following very legitimate and indeed necessary question, "Can the results of experiments carried out on animals be regarded as applicable to man?" Let me say that I am not concerned here with the ethical aspect of my subject.

Can the results of experiments performed on animals be regarded as applicable to man? If we are to adhere to precise language, we are under no suspicion of "beating about the bush" if we refuse to answer our question either with a direct "yes" or "no"—many most important questions are insusceptible of monosyllabic answers. The results of such experiments as can be performed on animals can, as a rule, be transferred to man, though not without reservations, and these vary with the nature of the experiments. It is our object to discuss these reservations.

I wish to preface my remarks by a word or two about the meaning of the word "certain." Little in this life is "certain" in the absolute sense. Your secretary asks me in March whether I will lecture to you on June 5th. I say, "I shall feel honoured." He says, "Are you 'certain' that day will suit?" I look in my book and I say "yes." He at a later date issues a notice stating that: "The Eighth Stephen Paget memorial lecture will be delivered by Prof. J. Barcroft on June 5th, 1934, in the School of Hygiene and Tropical Medicine. The chair will be taken by the President, the Rt. Hon. Lord Lamington," &c. Now none of these things are "certain" in the absolute sense. I may die; the chairman may be sent abroad on urgent public business. An earthquake may wreck the building; nevertheless the secretary is not guilty of inaccuracy; to qualify his statement would be but pedantry. We understand by "certain," in this connexion, something which is so certain that we may reasonably take action upon it. This question, like most other questions, is largely one of probabilities, and as such even a single experiment on an animal has a value. You take a draught by mistake from some bottle the contents of which had, so far as you knew, never previously passed human lips; your apprehension would be great in any case, but it would be much greater if you knew that a comparable dose of the contents of that bottle had killed a rabbit than if you knew that the material had been administered to the animal without any perceptible effect. The event might not justify you, nevertheless that confidence so far as it goes would be wholly reasonable. In expecting that the drug would not kill you because it did not kill the rabbit you would be using an uncertain weapon, but even so you would run no mean chance of hitting the target. The small amount of experimental knowledge yielded by a single experiment on an animal would have a value. To attain a higher degree of certainty the problem becomes one of narrowing the issue, of bringing the target ever nearer to the marksman until in the end the chance of a direct hit amounts as nearly as possible to a certainty. How far can this be done?

### Objective Experiments

I will first take the case of relatively simple substances, for it was in the use of such that I, personally, found myself face to face with this problem in a form which admitted of no evasion. That approach had to do with the administration of simple chemical substances which in one way or other act on the relatively uncomplicated processes of living protoplasm. The most obvious way of narrowing the issue is to broaden the basis of experiment. You can learn something as I have said by experimenting on a single form of life, but the more various the species on which you experiment the less uncertain will be the extrapolation from animals to man. That would follow a mere consideration of the probabilities of the situation. But you can narrow the issue still further. If you find differences between different forms of life, and if you can ascertain the causes of these differences, and if you can place man, relatively to these causes, you have narrowed the issue considerably. For instance, in the category of simple chemical substances may be put such a protoplasmic poison as hydrocyanic acid. The mode of action of this drug, largely through the researches of Evans, of Keilin, and of Warburg, is now known; it prevents the oxidation processes of the body by destroying the action of the enzymes concerned; in the case of the higher vertebrates the essential failure is that of the activity of the respiratory centre. There is no reason to suppose that these essential processes of life in man differ materially from those of other mammals, and therefore it might be supposed that weight for weight the lethal dose of prussic acid would be of the same order throughout the warm-blooded animals. Fig. 1 shows a number of curves. They refer to the strength of prussic acid vapour in the air (ordinate) which proves fatal to various mammals in the times given in the abscissa.

* The eighth Stephen Paget memorial lecture, delivered on Tuesday, May 5th, 1934, at the annual general meeting of the Research Defence Society.

Similar curves have been drawn out for other mammalian species, great and small; they all fall within the limits of the area A B C D E F G. With so much information therefore it would seem extremely likely that somewhere within the area, or not far outside, the curve for man would fall. To take an example, if we are driven by circumstances to take action, and wish to know how long a man can survive a concentration of 0·6 milligramme hydrocyanic acid gas per litre, the answer is that he would be exceedingly unlikely to die if exposed for less than one minute and extremely unlikely to live if exposed for much more than 15 minutes. This answer we know to be correct so far as the inferior limit is concerned, for the matter was on one occasion put to the test by an experiment on man. The subject was in the gas for upwards of two minutes, at the end of which time he was still in possession of his faculties.

The limits of course are wide, and if we knew the reason why the dog and the mouse are so susceptible, while the monkey and the guinea-pig are so resistant—the monkey at one end of the scale and the guinea-pig at the other—we could probably place the toxicity of the gas for man within much more precise limits. Concerning the great susceptibility of the mouse there is nothing surprising. It would seem to follow a general law familiar to all physiologists, the mouse being very small passes a great deal of air through its lungs in a given time for the size of its little body. It therefore per gramme of mouse inhales a great deal of the gas. Now the mouse can only live if it destroys the prussic acid as fast as the gas is inhaled. There is no special reason to suppose that the power of a gramme of mouse to destroy prussic acid is greater than that of a gramme of a larger animal, the mouse therefore is killed in low concentrations of the gas.

The dog forms a more interesting study, it is more akin to man in size and quite of the same order as the monkey or the goat. Why is the dog so susceptible? The first point to emphasise is the special way in which the drug is administered—namely, by inhalation. The lethal dose is much the same for most mammals, including those mentioned when injected into the blood, but a given concentration when breathed produces widely different results, it is natural to ask this question. When the drug is injected intravenously he is not particularly susceptible. The question therefore arises—do the dog and the goat really inhale the same quantity of air weight for weight? We may reasonably suspect that they do not. When the animal is exposed to hydrocyanic acid the initial effect of that gas on the respiratory centre is one of stimulation. The dog is capable of a much greater and more sustained degree of activity than most other animals. He can run down almost anything and pre-eminently he can run down man, from which it may be inferred that the maximal total ventilation of which the dog is capable is for its size greater than in man. The reason why dog yields so quickly to an atmosphere of prussic acid is probably due to the power of his respiration; he takes a much larger quantity of the fatal gas; in short, he takes a bigger dose. Knowing these things the issue is much narrowed, and it might confidently be predicted not only that man would fall inside the limits which I have indicated, but that the gas would be much less powerful in its effect on man than on the dog, and that, again, is so because on the occasion of which I told you there was a dog in the lethal chamber with the man; at the termination of the experiment the dog was moribund.

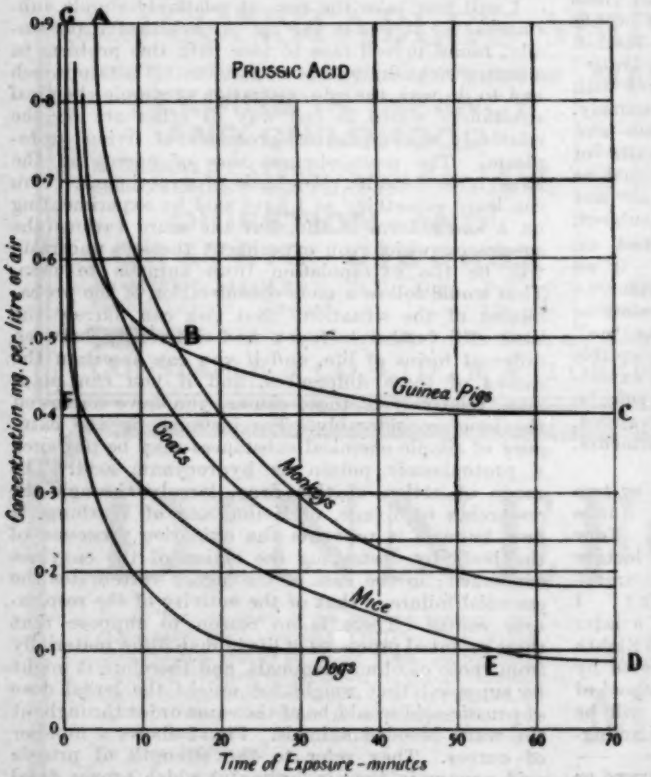


FIG. 1.—Concentration curves showing time of exposure to HCN, which produce 50 per cent. deaths.

I need not emphasise the practical importance of the problems. Prussic acid itself has come into use on a large scale for the decontamination of ships, and questions are constantly arising whether exposure to the gas can have been the cause of subsequent disability. Not only so but in the ever-increasing complication of industrial processes new dangers arise from the exposure of employees to unsuspected gases in the atmosphere, and in case of some unexplained death or illness questions arise at once—What fumes were in the air to which the victim had been exposed? Were they toxic? Can he have been exposed to them in sufficient concentration to account for his illness?

But not all gases met with in commerce offer so simple a problem as prussic acid—e.g., gases which irritate the lungs such as chlorine or phosgene offer a more complicated type of problem. They are both met with in commerce and about both the question arises, what concentrations can man tolerate? Is it possible without doing experiments on man to obtain information on the toxicity of irritant gases, and if so how reliable is that information?

Fig. 2 shows the concentrations of gas which ultimately prove fatal if the animals are exposed for the times stated. Here again, unless the man has some special property which animals have not, he is likely to fall within the general area occupied by the curves. The area is a very wide one.

Can we by considering the physiology of the animals narrow it? The apparent resistance of the rabbit and the goat can be explained; they have remarkable powers of holding their breath—faced with an irritant gas they can and do refuse to breathe it. As man has not this power the rabbit and the goat may be wiped off the picture. The remaining animals, and there are many more than those shown, form mostly a compact area. They are so diverse and the area so compact that the compactness can scarcely be due to chance and therefore unless man has some peculiarity he may be supposed to fall in this compact area. There is, however, one peculiarity of man which may affect the situation; irritant gases produce coughing in man. There are many quite harmless ways of producing a fit of coughing in which case the effect of coughing on the total ventilation may be measured.

Can we without doing an experiment on man give any information about the concentration of chlorine or phosgene in the air of a works which we would confidently describe as not being injurious to man? Such a question might arise in case an employee developed some lung trouble after exposure to an atmosphere which caused suspicion. Clearly we can answer it with a high degree of probability. The curves in Fig. 2 apply to deaths, but a similar series might be made out in which the time of exposure was plotted against the just perceptible lesion. There is no reason to suppose that a greater or less concentration of chlorine or phosgene would be required to produce a lesion in man than in animals generally and so, allowing a margin of safety, it would be possible to say, unless a man were exposed to such and such a concentration for such and such a time, he would be unlikely to be injured. This, of course, is not intended to weaken the practice of so designing plant as to have the air quite pure.

### Experiments on Sensation

It seems clear that for experiments of simple type, the results of which are purely objective, a great deal of information may be obtained upon animals which can be transferred with considerable confidence to man. How far can experiments on animals yield correct information with regard to human sensation? The difficulties here are much greater and for two reasons. The first is that the various sensations are developed in very different degrees throughout the mammals including man; the second is the obvious difficulty of getting the animal to tell you what he feels. I take these difficulties one by one.

1. Concerning the unequal development of sensation, it is a commonplace that some sensations are ill-developed in man whilst others are highly developed. The sense of smell for instance is obviously very poorly developed in man as compared with very many animals. Yet, keeping still to the study of the respiratory passages, things in the air which are intensely irritating to man appear to have no effect or scarcely any effect upon animals. In such cases, of course, it is not possible to decide how much of such a substance must be in the air in order to produce irritation of a given degree of gravity. The recognised procedure is simple; the test must be made upon a human subject, but the subject is exposed first to a concentration of the gas in the air so dilute that he cannot feel it and gradually and in successive tests the concentration is increased until the required information is obtained. Of those who have exposed themselves to such tests I should doubt if there is now alive in this country anyone who has done so more freely than Prof. Raper of Manchester, who, during the war and in collaboration with the late Colonel Harrison and Major Ball, was responsible for that marvel of efficiency, the British Army respirator. I mention the matter, simple as it is, for the sake of establishing the general principle, which

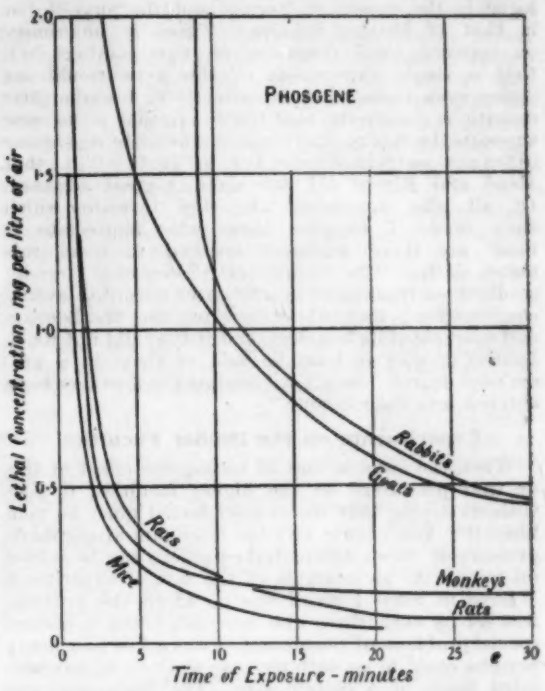


FIG. 2.—Concentration curves showing time of exposure to phosgene, which produce 50 per cent. of deaths within three days.

can be applied to more delicate and more complex problems—viz., that of working up from something which is harmless, to solve a problem about something which is the reverse.

2. I said that there were obvious difficulties in getting an animal to tell you what he feels; note that I say *what* he feels not *whether* he feels. If an animal is in pain I am sure that a person versed in his language would know it. I doubt, for instance, the possibility of an animal in the Zoological Gardens experiencing real suffering without the fact being obvious to one of the trained attendants in that institution. To define exactly what is being felt is, however, a matter so difficult that even the most experienced experts do not always find it easy. The instance of such an experiment which first comes to my mind is the classical one in which Head and Rivers explored the sensations contingent on the cutting, and regeneration, of the nerve going to an area of skin on the forearm. It may be doubted whether a greater superstructure of theory was ever built upon a single experiment. The phenomena of sensation as they appeared to and were described by Head, the partner whose nerve was cut, shaped themselves into the theory of crude and delicate sensibility, as being quite distinct forms of sensation, a theory so intriguing that it soon became expanded, especially by Rivers; so that before his death it embraced not merely the phenomena of regenerating nerve and mental aberration, but a whole system of philosophy. Yet the tragedy of all this is that no

subsequent observer has found it possible in portraying his sensations to reproduce Head and Rivers' picture of epicritic and protopathic sensation. Three very serious researches have been carried out on this subject from different angles. The surgeons have done it in the persons of Trotter and Davies, the psychologist in the person of Boring, and the physiologist in that of Sharpey-Schafer. There is unanimity as between these observers on two points: first, that a single experiment of this type would not suffice even to teach them correctly to describe their sensations; secondly, that the description in no case supports the theory that crude and delicate sensations differ not only in degree but in kind. Not that Head and Rivers did not make a great advance. Of all who appreciate the step forward which they made I imagine those who appreciate it most are those whom it inspired to tread this same path. The theory of protopathic (crude) as different from epicritic (delicate) sensation awaits confirmation; meanwhile there remains the heroism and example of its founders, and if they did not reach finality it may at least be said of them in a pre-eminent degree "they have laboured and others have entered into their labour."

### Experiments on the Higher Faculties

When the issue is that of testing the effect of this or that procedure on the higher faculties, it goes without saying that the subject tested must be man himself. You cannot test the minimum atmospheric pressure at which differential equations can be solved on mice. As an example of the sort of experiment I have in mind I recall one in which the problem was set by authorities who were interested in certain special problems of ventilation. I was asked how many persons could in an extreme case work in an unventilated room of a certain size. The first issue was this, if a certain number of people are in a closed room what is the essential factor which will reduce the quality of their work? In a small way it is the same problem as that of what killed the people in the Black Hole of Calcutta. History has always assumed that they died of asphyxia. Modern views of ventilation all point in a different direction—namely, that they died of heat stroke. If there is no through current and the amount of heat produced by persons in a room is greater than the walls of the room can carry away, the temperature of the inhabitants must rise, and in the extreme case fatally.

In the experiment in question a well-built basement room was chosen—the weather was hot and sultry with no movement in the air. Eighteen persons, of whom 13 did expert typewriting, spent from 8 A.M. till 4 P.M. in the room. All the chinks round the windows were made tight with paste and paper, the door and chimney were closed up, and there was as nearly as possible no ventilation. Fans were going and everything was blowing about. The circulating air evaporated the perspiration from our skins, which in turn condensed on the walls. For my part I made analyses of the room air from time to time while others carried out their prescribed tasks, mostly typewriting. All went well. On the next occasion with the same room, the same people, and approximately the same weather, the procedure was changed. The fans were abolished, but all unknown to the subjects I removed some of the window panes, so that although there was no perceptible movement in the air of the chamber, it was perfectly pure from the chemical point of view. The remarkable fact emerged that not only were the subjects more comfortable on the first day, but they did their work better, made fewer typographical errors, and so forth. It goes without saying that such experiments cannot be carried out on animals. We are in fact getting near limits which define the area in which experiments can be carried out at all. Somewhere near that limit is the whole territory of psychological tests—a subject on which I do not feel myself qualified to speak. I will only say this: that more than a dozen years ago I assayed to discover whether the mental abilities of a party of researchers who came with me to Peru were of their usually high standard when living at an altitude of 14,000–15,000 feet in the Andes; for this purpose I gave them what seemed to be suitable mental tests; the results when tabulated showed little or no falling off as compared with those yielded by the same persons doing the same tests at sea level. Yet the results of the tests were in a sense quite illusory, and obviously so—the work was as well done in the Andes as on the sea, but the effort of doing it and the concentration required were enormously greater. I expressed my disappointment at my failure to show up the mental deteriorations of my party, to Dr. Miles than whom I suppose there was no higher authority at that time on the value of mental tests, and I attributed my failure to my own inexperience. He very kindly said, "Barcroft, you are only where we all are." Since then much water has run underneath the bridge and psychological technique has made great strides, but speaking on this subject quite as a layman I suppose the difficulty of expressing in units which can be tabulated the amount which a given performance "takes out of the performer" is still a very real one.

Referring once more to Cerro de Pasco, I was told on high authority that an official of the Cerro de Pasco Copper Corporation would write a difficult report as cleverly at Cerro as in New York; but in New York he would do it in his stride, at Cerro it meant a subsequent trip down to the coast.

### Disease

Disease in its simplest form—or at all events its simplest form from our point of view—may be no more than an upset of the balance of normal conditions in the body. A case in point would be the effects of hæmorrhage. The scheme of the hydrostatic arrangements in the human body is of the same character as in the higher animals; indeed, on broad lines there is singularly little difference throughout the mammals. The effects of deprivation of the blood can therefore be studied quite well on animals, and all the relevant information can be obtained. True it was an experiment on man which gave me a very broad hint that the volume of circulating blood could be adjusted within limits by contraction of the spleen. But the proof came entirely from animals, and more especially the very striking demonstration that quite a large volume of blood may be lost without prejudice to the actual amount of fluid in circulation. The amount being made good from the spleen and other depots. We may go further, and say that not only the effects of diminished blood volume can be ascertained by animal experiment but a great deal of information about the possible causes. The production of histamine in wounded tissue, its effects upon the permeability of the vessel walls, and so forth, all these have been discovered and demonstrated on animals. Man has no monopoly of histamine, nor does it act differently on human and feline tissues. It therefore happened that armed with a working knowledge of the effects of this material upon animals,

Dale and Richards were at once able to recognise these same effects when they saw them in cases of wound shock. And if the last word has not been said on this subject, as Blalock would have us believe, it is not because man differs from other mammals in his reactions to loss of fluid from the vascular system.

But there are other and more complicated problems connected with the causation of disease. Let us turn to one or two presented by communicable disease. In general there are two problems: (1) what is the organism, or virus, which is the essential cause of the disease; and (2) what is the intermediate host, if any, by which it is communicated? If the disease is one to which a great many forms of life are susceptible the ground may be cleared by experiments upon them—such a case is plague. The typical symptoms of this devastating complaint are shown by mice, rats, and guinea-pigs. Rabbits[1] when inoculated, while rats, mice, monkeys when fed on cultures of plague bacilli acquire the disease and generally die with characteristic symptoms and lesions. Among these animals the rat is pre-eminent. Experiments with these have shown how the epidemic is transferred from rat to rat—namely, by the appropriate flea. Moreover, infected fleas when they bite other animals communicate disease. It is no wild exterpolation therefore to assume that the rat flea, if he is infected and bites a human being, will give the disease to him. If the human experiment had never been performed, there would have been a sufficient degree of certainty to warrant the declaration of a war against rats and their fleas, as the most promising campaign for the purpose of eliminating of plague among human beings.

*Trench Fever.*—But the disease may, unlike plague, be one which is not known to reproduce its symptoms in any form of animal life. Then the human experiment is imperative. The history of trench fever, which I quote from Major Byam,[2] is a case in point.

"The question was, How did the germ leave the sick man and enter the healthy? Our recent work carried out for the War Office Trench Fever Research Committee has done a good deal to clear this mystery up. Several very gallant men came forward to help us in our task, and it is not too much to say that without such help we would have found out nothing, since experimental animals, which are all apparently resistant to trench fever infection, could not be used. These men volunteered to let us try to give them trench fever in any way we thought the disease might spread naturally in the field. The first two men to come forward were W. H. Cole and H. H. Edgeler, and to them great credit is due, as the work for which they offered themselves might, for all they knew, be productive of the most unpleasant consequences. Attempts were made to convey trench fever to these two men by allowing lice taken from the trench fever patients to feed on them. Nothing happened though the experiments were continued many weeks, but as we anxiously watched the men from day to day we were struck with the fact that they never scratched their skin where the lice had bitten. Was scratching an essential to infection? To test this possibility the skin of a new volunteer named D. Sullivan was on Feb. 5th, 1918, scratched by means of a needle, and the droppings of the lice feeding on Cole and Edgeler rubbed into it. A week later Sullivan developed trench fever, and as a result the usual method of transmitting the disease had been demonstrated, for we have repeated this and similar experiments many times with unfailing success. We have ourselves kept the droppings of lice for four months and then produced trench fever by introducing them into the skin of a healthy man which shows how truly infectious they are."

*Yellow Fever.*—Trench fever is not likely to kill the subject. But how does the case stand if, like yellow fever, the disease is one which apparently is almost certainly fatal? It has been claimed that 94 per cent. of the cases of yellow fever in the great epidemic in Rio in 1898 died. So we pass to yellow fever. When the subject became ripe for experimental work there was believed to be no experimental animal which could be used, for the simple reason that no animal was known to be capable of taking yellow fever. It was possible, however, to take advantage of the principle of working up from the harmless to the harmful, because there are numerous strains of yellow fever. If I may quote from the account given by Prof. Boyce of the work of the American Commission:

"Finlay found that in 18 per cent. of his inoculation experiments there resulted a very benign form of yellow fever." Of these Case V. was one.

"Case VI.—C. W., American, non-immune, aged 27, with his full consent was at 9.30 A.M., Jan. 31st, bitten by two of the three mosquitos that had been applied to . . . Case V. The interval that elapsed since their contamination was therefore 51 days." The subject obviously showed characteristic symptoms of yellow fever in three or four days. Convalescence was rapid.

Roughly then let me sum up: purely objective experiments do not as a rule demand the use of man; in a great many cases the relevant information can be obtained on animals. Experiments on sensation and on mental performance must usually be carried out on man himself. As regards the communication of disease, if animals show symptoms of the malady they can be used at all events to clear the ground. If they do not, resort must be had to the human experiment.

## Conclusion

The considerations with which I opened this discussion brought back to me some recollections of the Great War. But a greater war is constantly being waged. It becomes dramatic when nations clash or when capitals are wiped out as was Rio by yellow fever. The dramatic element is due to the concentration of the fatalities in a small area, but disease is waging war to-day against mankind; less dramatically because its victims are diffuse in space, but no less certainly.

The proof that plague could be communicated to men was according to the text-book statement first supplied by Whyte, who injected himself with blood taken from a plague patient. I leave it to the judgment and conscience of my hearers to decide whether if to-day the matter could be settled with a high degree of certainty on rats, marmots, monkeys, and the like, such an act in any case one heroism would not verge on unjustifiable suicide?

The second instance quoted was injection of the disease into a condemned criminal. Having regard to the great number of experiments which usually are essential to the proof of anything, having regard to the paucity of condemned criminals, and having regard to the obvious abuses to which such a course is open, I again leave it to your judgment whether, if the relevant information can be acquired from animal experimentation, we should have recourse to the use of criminals. Personally I am against the use of criminals.

The third instance quoted was a deplorable accident in Vienna in which workers in some unaccountable way became infected from the germs of a culture.

## A Pledge

I do not leave it to your judgment whether in the face of death around us we are to fold our hands and wait for accident to enlighten us. We of the

[1] Manson's Tropical Diseases, London, 1931, p. 256.
[2] Quoted from "Lice and their Menace to War," London, 1929. Chapter XI. written by Major Byam, R.A.M.C., p. 126.

Research Defence Society are pledged to the combat; we believe we have open minds; we believe that research is a most potent weapon, therefore we are pledged to research; we are pledged to certain methods of research—namely, animal experimentation—because we think that many problems can be solved most rapidly and most humanely by that method; but we welcome no less any other method which will be of use, any other weapon with which the war may be waged. We welcome criticism, but we judge it according to its constructive value. With the policy of waiting for the illuminating accident, with the policy of folding of the hands, with the policy of wrapping the talent in a napkin, we have nothing to do, but all legitimate methods, all useful criticism we welcome "so that by all means we may save some."

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# THE RÔLE OF THE LIVER IN THE METABOLISM OF CARBOHYDRATE AND FAT *

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## II.—THE LIVER AND CARBOHYDRATE METABOLISM

It was Claude Bernard who first appreciated the significant fact that the liver may provide sugar for the body. He regarded liver glycogen not only as a store of carbohydrate, but also considered the possibility that the liver might secrete this material in much the same way as we now believe other organs do their internal secretions. Because of the relative ease with which changes in liver glycogen may be studied, a great deal of attention has been given to this substance and perhaps not enough to the conditions which govern the rate of discharge of sugar from the liver. There is no room for doubt that the amount of glycogen and the output of sugar may sometimes be closely related, but these factors are not as interdependent as is often assumed. To a reviewer who entertains the idea that evidence will be forthcoming that sugar is made from fatty acids in the liver under certain circumstances, the discussion of gluconeogenesis at the present time is particularly unsatisfactory. Furthermore, nitrogen excretion as an index of sugar formation from protein leaves much to be desired. The difference between the sugar content of the blood of the hepatic vein and that of the hepatic artery and portal vein, which is not accounted for by change in liver glycogen, dextrose, or lactic acid, is the only reliable index of the rate of gluconeogenesis taking place in this organ.

### Insulin and Gluconeogenesis

The evidence that there is an excessive sugar production by the liver after the removal of the pancreas is quite satisfactory, and since insulin completely corrects this abnormal condition there are good grounds for the belief that it inhibits gluconeogenesis in the diabetic. The end-results of insulin in the diabetic organism could be adequately explained on the hypothesis that insulin restored the ability of tissues to utilise dextrose, but, as I mentioned in the previous lecture, this property does not disappear after pancreatectomy.

Laufberger suggested inhibition of gluconeogenesis as a complete explanation of the action of insulin in the normal animal. The well-established effect on muscle glycogen proves that this is not the case. The probability that inhibition of gluconeogenesis plays a part in the action of an excess of insulin was stressed by Lesser and his colleagues and by Best, Dale, Hoet, and Marks.[1] As Cori [2] has pointed out, there are several series of experiments the results of which can best be interpreted on this ground (Issekutz; Macleod, Noble and O'Brien; Sahyun and Luck; Cori, Cori, and Buchwald). The finding that in unanæsthetised animals the hepatic vein blood contains less sugar when an excess of insulin is provided, and the less satisfactory evidence that this fall precedes the decrease in systemic blood-sugar, is very significant. This work has been conducted on adult rabbits and dogs in which an excess of insulin produces a fall of liver glycogen and free sugar. The lactate content may be approximately constant (Cori, Cori, and Goltz; Kotschneff [3]; Molitor and Pollak). These points are so important that repeated confirmation with certain extensions and possibly improvements in the experimental technique is desirable, but we may regard the evidence, at present available, for inhibition of gluconeogenesis in the normal animal by an excess of insulin as reasonably satisfactory.

### Liver Glycogen

Our attention is much more frequently focused on glycogen. A convenient way of discussing liver glycogen in brief space may be to consider the formation and breakdown of this substance in diabetic and in normal animals.

#### LIVER GLYCOGEN IN DIABETIC ANIMALS WITHOUT INSULIN

Minkowski could detect no glycogen formation in the liver of a depancreatised dog when dextrose was provided, but reported positive results with fructose. Cruikshank in 1912 did not confirm this finding with fructose, but the livers he used were obtained from animals from which heart-lung preparations had been made. Paulesco found just under 3 per cent. of glycogen in the liver of a depancreatised dog after the oral administration of sucrose or glucose plus fructose. Banting, Best, Collip, Macleod, and Noble found 1·3 per cent. in the liver of one dog to which very large amounts of sucrose had been given. Bollman and Mann [4] have recently reported a transient retention of ingested fructose in diabetic dogs. This may be due to glycogen formation, which Cori has shown to be particularly rapid in the normal animal when this sugar is provided. There is no convincing evidence that the diabetic is able to burn fructose better than dextrose. Bodo, Tui, and Farber, and Major and Mann, have demonstrated a definite accumulation of glycogen in depancreatised dogs after the intravenous administration of dextrose. The previous work was open to several objections, which are successfully met in the recently reported studies. Major and Mann used dogs which had been treated with insulin immediately after the removal of the pancreas. Insulin injections were discontinued for a period of five days before the experiment. On the fifth day glucose was infused for from 10 to 12 hours. In a convincing number of the animals used, the deposition of glycogen was approximately 1 per cent. greater than that of control dogs. It is thus established that the depancreatised animal is able to store glycogen in the liver in the apparent absence

* Three lectures delivered for the University of London at University College on Jan. 11th, 15th, and 18th. Lecture III. will appear in a forthcoming issue.

of insulin, and under these circumstances we must look upon this process as proceeding at a slow rate (possibly by reversal of the action of glycogenase). The blood-sugar must have been very high in these experiments. There is no evidence that even a trace of insulin is present under these conditions, but the possibility that cells cling tenaciously to the last few molecules cannot be completely ignored. In the presence of insulin the rate of glycogen formation is, of course, greatly accelerated in both liver and muscle. Under the usual conditions in depancreatised dogs not receiving insulin, liver glycogen is at a very low level. In the decapitated cat some 20 hours after removal of the pancreas no recovery of liver glycogen is demonstrable. When the pancreas is present this process proceeds with considerable speed (Evans, Murphy, and Young).[6]

### LIVER GLYCOGEN IN DEPANCREATISED DOGS WITH INSULIN

In 1923 Banting, Best, Collip, Macleod, and Noble found a very large deposition of glycogen in fed depancreatised dogs which received insulin. These results, which have been amply confirmed, established only that the accumulation of glycogen was an end-result which was observed some 48 hours after the insulin administration had been commenced. Quite recently Bodo and Neuwirth have shown that the increase of liver glycogen following the administration of glucose and insulin begins practically immediately, and the accumulation is apparently continuous. Hédon and Cori independently demonstrated a rise in liver glycogen in the fasting depancreatised dog after the administration of insulin. Cori found similar results in cats.

### BREAKDOWN IN LIVER GLYCOGEN IN DEPANCREATISED ANIMALS

The rapid decrease in liver glycogen after removal of the pancreas requires no new comment. Adrenaline accelerates this process. The breakdown of hepatic glycogen in depancreatised animals receiving a constant amount of insulin has not been extensively studied. It is probable that the process proceeds very much as in the normal animal. There is an opportunity for further work in this field, however, because it would be interesting to determine to what extent, if any, the action of adrenaline on the liver glycogen of normal animals is due to changes in the rate and amount of insulin liberated from the pancreas. Small laboratory animals in which complete pancreatectomy can be readily performed are not easily available, but C. N. H. Long informs me that kittens have provided useful preparations.

The inter-relationship of the adrenal medulla and the pancreas is so well established that it may now be regarded as the duty of the experimenter who uses insulin to study, at the very least, suprarenalectomised animals before attributing the effect produced to a direct action of the antidiabetic substance and to study depancreatised animals as a part of an investigation of adrenaline action on carbohydrate metabolism. When we follow this idea to a logical conclusion the necessity of eliminating other glands of internal secretion and the need for studies of perfused organs under physiological conditions becomes increasingly apparent.

### LIVER GLYCOGEN IN NORMAL ANIMALS

In normal animals very convincing evidence has been obtained by Cori and others that many different sugars give rise to glycogen in the liver—glucose, fructose, galactose, mannose, and arabinose. Xylose and the methyl pentose rhamnose do not increase liver glycogen when fed in a manner similar to the other sugars. Some of the amino-acids may provide a source of liver glycogen, but results obtained on diabetics cannot be transferred without modification to normal animals (Hodgson).[4] Glycerol is effective. One of the most interesting of the three carbon compounds is, of course, lactic acid. The dextrorotary lactic acid particularly has been found to form glycogen with great rapidity. Lactic acid formed in muscular exercise (Himwich; Long and Grant) may result in an increased liver glycogen. This aspect of the subject has been frequently reviewed. Drury and Salter [7] have recently shown that many derivatives of glucose which form glucose or glycogen readily in the intact animal fail to benefit the dehepatised rabbit. These results and those previously obtained by Mann and Magath emphasise the importance of the liver in the conversion of even very simple glucose derivatives into a form in which they are utilisable.

Since we may believe that none of these substances mentioned deposit liver glycogen in more than small quantities in depancreatised animals without insulin, *we must attribute this formation in normal animals in large part to the effect of insulin.*

Yet in 1923 McCormick and Macleod, using rabbits, and Dudley and Marrian, using mice, found a definite decrease in liver glycogen in fed or fasted animals when insulin was administered. In 1929 Cori and Cori found that when the blood-sugar levels in two groups of rats was maintained approximately the same by supplying more sugar to those who received insulin, deposition of the liver glycogen was of the same order in each group. Bodo and Neuwirth, working on normal dogs under morphine-chloralose anæsthesia, found that the glycogen storage in the liver which occurred with sugar alone was decreased when small amounts of insulin were given. Larger amounts of insulin produced a decrease in liver glycogen. This breakdown in liver glycogen was not due to hypoglycæmia, which has been shown in a convincing manner to be accompanied by liberation of adrenaline (Cannon; Houssay).

Before we assign to insulin two antagonistic rôles in the normal animal with regard to liver glycogen, let us examine other experimental results.

The experiments to which we have referred suggest that insulin and glucose given to a normal animal never result in a greater deposition of liver glycogen than would be produced by the sugar alone, that is, that the sugar liberates an optimal amount of insulin from the animal's own pancreas. There are, however, exceptions to these results. Deposition of liver glycogen was reported from Lesser's laboratory to be somewhat increased in the livers of mice when insulin as well as sugar was provided. Collazo, Händel, and Rubino fasted normal guinea-pigs for 18 hours and then administered glucose by stomach-tube. The animals which received insulin after the sugar had a greater content of liver glycogen than those which received the sugar alone. In 1929 Goldblatt [8] was able to show that exogenous insulin resulted in an increase of liver glycogen in the fasting young rabbit. This result has been confirmed by Sahyun and Luck, Corkill, and Bischoff and Long, and is the most notable and consistently recorded instance of increase in liver glycogen in the normal animal after insulin administration.

In view of the fact that the usual effect of an excess of insulin in most species is a decrease in liver glycogen, the question arises whether or not this action of insulin in young rabbits is a direct one. All of these workers, including Goldblatt, have shown that adrenaline injections may cause an increase in liver glycogen in these young animals, and it may be asked whether or not the insulin effect is due to a participation of the adrenal or one of the other glands, the secretion from which affects carbohydrate metabolism.

When the pituitary gland has been removed from these young rabbits insulin fails to produce deposition of liver glycogen (Corkill, Marks and White),[9] and I believe that preliminary experiments from the same laboratory conducted by Corkill and Cope indicate that the effect is not seen in suprarenalectomised young rabbits. Adrenaline seems a much more likely intermediary in this action of insulin than a pituitary hormone. In any case it appears unlikely that it will be necessary to consider this effect on young rabbits as a direct action of insulin.

The possibility must also be considered that the depletion of liver glycogen after injection of insulin observed in most species which have been studied is attributable to liberation of adrenaline which, as we will see later, may cause either an increase or a decrease in liver glycogen. There are difficulties in the way of accepting this conclusion. In 1927, Cori and Cori, and in the same year Artundo, found a decrease in liver glycogen in adrenalectomised rats which had received insulin. We cannot, therefore, under certain circumstances, hold the adrenal responsible for the decrease in liver glycogen so commonly observed after insulin. (It must not be forgotten, however, that the adrenal medulla may normally participate in this process.) This action of insulin may, however, be exerted only in part directly on the liver. We should not lose sight of the fact that under physiological conditions the action of insulin seems to be the storage of glycogen in the liver, and I still find it difficult to believe that experiments in which the amount of insulin present is increased only very slightly over that available from the pancreas will not reveal an increase in liver glycogen in species other than young rabbits or kittens. This plan has as yet yielded no success using rats, but samples should perhaps be taken earlier. The presence of large amounts of glycogen in the normal liver is, after all, due in large part to the presence of the pancreas. No one has ever noted a hyperglycæmia to which physiological significance can be attached after the administration of insulin. The decrease of liver glycogen may be secondary to the demand for sugar to form muscle glycogen, or for oxidation, and the failure of deposition of liver glycogen may be accentuated by the *decreased ability of the liver to produce dextrose under these conditions*. Deposition of muscle glycogen is so greatly accelerated (Best, Hoet, and Marks) by the presence of an excess of insulin that this process may take preference over a similar one which under normal conditions is also being encouraged in the liver. There may be some mechanism by which this preference is secured which does not involve hypoglycæmia or liberation of adrenaline. This conception may be expressed in other words; there is no evidence that insulin causes, by direct action on the liver, breakdown of glycogen. When the supply of dextrose is adequate liver glycogen is deposited; when insulin is present in excess, less of the sugar may be available for deposition as liver glycogen than when the concentration of the anti-diabetic hormone is lower. The evidence also suggests that the excess of insulin decreases the supply of dextrose by inhibiting its manufacture within the liver. This may result in a lowered glucose "tension" in the cells where liver glycogen is made. If no sugar is being manufactured in the liver and sugar is not administered, one might expect the glucose "tension" to be lower than that required for glycogen synthesis. Liver glycogen may be formed from lactic acid, so it is not established that the "tension" of dextrose is always an index of the amount of material available for synthesis.

### ADRENALINE AND LIVER GLYCOGEN

In this discussion we have assumed that adrenaline can cause either breakdown or storage of liver glycogen. There is no doubt that the action of adrenaline is to accelerate the breakdown, but this is not the only effect of this substance.

In 1909 Pollak demonstrated a fall in muscle glycogen and an increase in liver glycogen in starved adult rabbits which were given rather large doses of adrenaline. More recently Cori has provided a more convincing demonstration of this phenomenon, and it appears likely that this is one of the usual physiological rôles of adrenaline. Whether a fall or a rise in liver glycogen is noted, depends on the time of sampling after the adrenaline injection (Luck and Sahyun). A fall is first observed, but the position is later reversed when lactic acid from muscle is built up into glycogen in the liver. Dextrose formed from the lactic acid may be responsible in part for the observed hyperglycæmia. It is only in the animal with intact pancreas that lactate from muscle has been shown to be formed into liver glycogen. This process, which may or may not proceed via dextrose, may be found to take place slowly in the apparent absence of insulin. It is interesting in this connexion to note that after adrenalectomy the recovery of liver glycogen in decapitated cats is accelerated (Evans, Tsai, and Young).

In discussing the hyperglycæmia produced by adrenaline one must consider breakdown of liver glycogen, the supply of lactate from muscle, and the still very debatable question of inhibition of carbohydrate oxidation. If adrenaline were secreted at an increased rate for a short time, one might expect first a decrease in liver glycogen and a hyperglycæmia, a fall in muscle glycogen, and an increase in blood lactate. Some of the lactate may be converted into dextrose, and insulin already available or liberated in response to the hyperglycæmia will facilitate the formation of liver glycogen. Under these circumstances there is presumably no excess of insulin.

### INFLUENCE OF OTHER HORMONES

*Thyroid.*—In 1913 Kramer and Krause, 1924 Kusiyama, and in the same year Burn and Marks showed that liver glycogen could be reduced by repeated administration of thyroid extract. This effect on liver glycogen may be due to an increased activity of the thoracic autonomic nerve-fibres, with possibly liberation of "sympathin" in the liver, or may be in part due to the greater demand of apparently a variety of tissues for oxidisable material. There is, of course, evidence that the adrenals are made more active by thyroxine administration. The interesting work of Burn and Marks on the change in the response of animals to insulin and adrenaline as thyroid feeding is continued, and the correlation of these effects with the state of the liver glycogen, have been reviewed frequently. Interest in the effects of thyroxine on liver glycogen has been increased by the results of the recent work on the thyroid-stimulating hormone of the anterior pituitary. Eitel and Loeser[10] reported that injection of anterior pituitary extracts caused lowering of liver glycogen in normal but not in thyroidectomised guinea-pigs. The time relationships of the action of these extracts in the normal animals was similar to that which holds for thyroxine. It would, however, be unwise to conclude at the present time that the anterior pituitary may affect liver glycogen only through its thyrotropic hormone. As we will see later the diabetogenic fraction may exert an effect directly on the liver.

*Pituitary extract.*—It is perhaps unnecessary at the present time to consider the rôle of pituitary extract (vasopressin or oxytocin ?), since the balance of conflicting evidence suggests that this substance acts through liberation of adrenaline.

*Adrenal cortex.*—Numerous reports have been published recently on the rôle of the adrenal cortical hormone in carbohydrate metabolism. After double adrenalectomy in cats the carbohydrate reserves of the liver and muscles are depleted and there may be definite hypoglycæmia (Britton and Silvette).[11] This situation is corrected by providing the cortical hormone and glucose, but the effect is apparently not secured when glucose alone is given. This derangement of carbohydrate metabolism is not observed in some other species after suprarenalectomy, but Britton's recent work has added very necessary support to his contention that, in certain species, a disturbance of carbohydrate metabolism is one of the fundamental effects of cortical deficiency. Hypoglycæmia is, of course, observed in some cases of Addison's disease. It is certain that the next few years will bring us a great deal of new information concerning the effects of the hormone of the adrenal cortex on carbohydrate metabolism. There are many interesting experiments to be performed in adrenalectomised animals maintained by the cortical extract.

## The Anterior Pituitary and Carbohydrate Metabolism in the Liver

In view of the signal importance of the work on the relationship of the anterior pituitary gland to carbohydrate metabolism which has been accumulating during the past seven or eight years, a short review will be given here.

The abnormalities in carbohydrate metabolism associated with acromegaly of long standing or with various pituitary tumours need not be discussed. The interesting new physiological work on carbohydrate metabolism might be dated from any one of many starting points. In 1908 Borchardt found that the extract of the posterior lobe of the pituitary raises blood-sugar. In 1911 Cushing observed that pituitary deficiency was accompanied by an increased carbohydrate tolerance. After insulin became available Burn demonstrated an antagonism between "pituitrin" and insulin, and several groups of workers showed that animals were more sensitive to insulin after removal of the pituitary body (Olmsted; Geiling). Attention was focused on the posterior pituitary. The interesting work on the relationship of the pituitary to carbohydrate metabolism conducted in Houssay's department during the last eight years began with the idea that the secretion from the posterior lobe counteracted some of the effects of insulin. Houssay and Magenta [12] presented very convincing evidence, in confirmation of the work quoted above, that hypophysectomised dogs are much more susceptible to insulin than normal animals. Houssay and Potick [13] removed the anterior lobes of the pituitary from toads with the production of hypoglycæmia and increased susceptibility to insulin, and subsequently Houssay and Biasotti [14] found no marked diabetes after complete pancreatectomy in these hypophysectomised animals. A graft of the glandular (anterior lobe) protects them against insulin, while a transplanted posterior lobe does not have this effect. Biasotti and Houssay report that hypophysectomised dogs may exhibit severe hypoglycæmia spontaneously, that they always do after a prolonged fast or injections of phloridzin, and that in some cases very low blood-sugar may be observed even after complete removal of the pancreas. This very striking finding that diabetes is absent or very mild in completely depancreatised dogs from which the pituitary gland has been removed has been confirmed by Regan and Barnes, by Soskin (personal communication), and D'Armour and Keller.[15] The longest survival period reported is six months, but many of these animals may have lived much longer by this time. Sugar and acetone bodies excretion (Rietti) in depancreatised or phloridzinised dogs which have lost their pituitary glands is much less than in otherwise comparable animals with the pituitary intact. Biasotti and Houssay seem to provide good evidence for the suggestion that it is a function of the anterior pituitary to regulate sugar formation from protein and possibly from fat or, in other words, that gluconeogenesis is greatly decreased in the absence of the anterior pituitary. In partially hypophysectomised animals the basal metabolic rate is low (Dagg and Eaton), but according to these workers and to Houssay there is no perceptible change in specific dynamic action of protein. The blood-sugar may be approximately normal and the usual type of carbohydrate tolerance curve may in some animals give normal figures.

Corkill, Marks, and White [8] using rabbits as test animals have recently confirmed many of Houssay's findings in toads and dogs and have extended them in some directions. Hypophysectomised rabbits are very susceptible to insulin and the hypoglycæmia is not easily relieved by adrenaline or vasopressin. Adrenaline is usually less effective in raising blood-sugar in these preparations and the suggestion is made that the glycogen reserves are not readily mobilisable after removal of the pituitary.

### ANTERIOR LOBE EXTRACTS

The effects of extracts of the anterior pituitary may now be considered.

In 1926 Johns, O'Mulvenny, Potts and Laughton reported the production of hyperglycæmia in normal dogs which received "protein free" extracts of this gland. Houssay and Pottick found definite diabetogenic effects in toads. Evans, Meyer, Simpson, and Reichert produced diabetes of moderate severity in some, but not all, of their dogs which received daily injections of an alkaline aqueous extract prepared from beef anterior pituitary glands. This work was confirmed and extended by Houssay, Biasotti, and Rietti [16] who, using an alkaline extract of the anterior lobes, were able to produce hyperglycæmia, glycosuria, and acetonuria in normal dogs and rats, in partially depancreatised dogs, and in hypophysectomised, depancreatised dogs. Evans, in 1933, using normal dogs found lipæmia and hyperglycæmia. It is important to note that although pancreatic diabetes is somewhat modified by thyroidectomy in many species, the course of the condition in dogs after this operation is rapid (Yriart). It appears very unlikely on this ground that the anterior pituitary exerts its effect on gluconeogenesis through its thyrotropic principle. Furthermore, Houssay and Biasotti [17] have recently reported that hypophysectomy inhibits pancreatic diabetes in toads after removal of the suprarenals or thyroid. Transplantation of the glandular lobe exerts its diabetogenic effect in the absence of the adrenals or thyroid. While in these experiments both adrenals and thyroid were not removed in the same animal there seems little doubt that the diabetogenic effect was exerted directly on the liver. Campos, Curutchet, and Lanari [18] could not demonstrate the diabetogenic action of anterior lobe extracts in dehepatised toads.

While it is well established that removal of the adrenal medulla or interruption of thoracic autonomic nerve impulses increases the susceptibility of the animal to insulin, the evidence at present suggests that the substance in the anterior pituitary which affects the adrenal causes hypertrophy or prevents the atrophy of only the cortical tissue (Smith).

## Anterior Pituitary and Fat Metabolism in the Liver

In 1930 Burn and Ling found that alkaline extracts of the anterior pituitary increased the acetone body excretion in rats, and in 1931 Anselmino and Hoffmann reported an increase in the acetone bodies of rats' blood after the injection of an extract of the anterior pituitary. These workers suggest that a rise in acetone bodies may be produced with these extracts without causing a hyperglycæmia. This work of Anselmino and Hoffmann has been confirmed in large part by Magistris [19] and the rise in acetone bodies has been noted in my laboratory by Mr. J. Campbell. Magistris has studied the increase in the acetone body

content of rabbits' blood, using a modification of Engfeld's method. He believes that the active substance which caused an increase in acetone bodies is not identical with the sex hormone or hormones, with the growth-promoting substance, or the thyrotropic factor. Some of these points require confirmation. We have not as yet been able to obtain any evidence from the literature whether or not it is possible to separate this substance from the diabetogenic material described by Houssay and his collaborators.

It will be readily appreciated that these facts which I have outlined very briefly may necessitate considerable change in our conception of carbohydrate metabolism. It will be appreciated that some of the cases of diabetes which are observed at autopsy—and reliable investigators have stated that these may represent more than one-quarter of the total—have no obvious pancreatic lesion. While it is possible that serial sections of these glands might reveal some abnormalities it is in the minds of many students of the subject that diabetes may be caused in these cases, by over-activity of the anterior pituitary. It is perhaps easy to imagine a case of diabetes dying in coma as a result of a sudden increase in the rate of production of acetone bodies from fat in the liver without the production of a pancreatic lesion, but if the diabetes were long-continued, the results of Allen, Copp and Barclay, and Bowie, would lead us to expect that the hyperglycæmia would produce definite changes in the islands of Langerhans. On the other hand, the absence of widespread hydropic degeneration of the islet cells in many cases of diabetes in which hyperglycæmia had been present for prolonged periods suggests that in the human organism these cells may be resistant to the stimulating effect of high blood-sugar.

These findings appear to give support to those of us who believe that "over-production" of dextrose is the major disturbance in the diabetic condition. It appears quite likely that the utilisation of dextrose by the exercising diabetic dog in the absence of insulin may be abnormal (Yater, Markowitz, and Cahoon)[20] and there may be complicating factors in the human diabetic but I can, as yet, find no escape from the conclusion that the resting depancreatised animal is able to utilise large amounts of sugar. The only hope for those who support the unadulterated "under-utilisation hypothesis" is to find a substance in the anterior pituitary which directly or indirectly inhibits oxidation of carbohydrate. The report of Campos, Curutchet, and Lanari, that the fall in blood-sugar produced by removal of the liver in toads is checked by implantation of the anterior lobe, is worth investigating in this connexion. In the normal state we may consider that the gluconeogenetic process in the liver is accelerated by the anterior pituitary (also thyroid and adrenals) and inhibited by insulin. In the absence of both of these hormones gluconeogenesis is usually sufficient to maintain a normal blood-sugar, but the process does not proceed at an excessive rate. If the thyroid or adrenals or both were also removed from the depancreatised hypophysectomised animal the liver might fail to produce sufficient sugar and fatal hypoglycæmia might occur much as it does in dehepatised preparations.

This field should not perhaps be left without brief mention of some reports of Anselmino and Hoffmann, who state that they have obtained a substance from the anterior pituitary which causes hypertrophy of the islands of Langerhans and the appearance of new islet cells. It would be unwise to make any comment on these results which are not supported by very convincing chemical data until further reports have appeared.

## The Liberation of Insulin

Since insulin is one of the most important factors affecting the metabolism of carbohydrate in the liver, the control of insulin liberation is a pertinent question. I do not believe, however, that it is worth while to discuss again in detail at this time the chemical and nervous control of insulin secretion. The evidence seems overwhelming that a rise in sugar content of the blood increases the rate of output of insulin. There are many results which provide circumstantial and several supplying direct evidence for this view. The point which has been debated is whether the sugar acts directly on the pancreatic cells or through an effect on the parasympathetic centres in the hypothalmic region of the brain. The only objection which has been raised to the experiments of Gayet and Guillaumie [21] who added dextrose to the arterial blood supplying a pancreas grafted into the neck of a dog, was that the solution was hypertonic and that the tonicity rather than the sugar content caused the liberation of insulin and the hypoglycæmia. Recently Kosaka has injected 5 per cent. dextrose in saline into the pancreatic artery in chloralosed cats. The accelerated fall in blood-sugar under these conditions as compared to that which follows sugar injections into the portal vein or femoral artery, presumably indicates an increased rate of liberation of insulin. This result does not mean that the rate of insulin liberation is not increased by impulses along the parasympathetic system or that a *not yet* accurately located centre in the brain may not be stimulated to send impulses down the parasympathetic by increasing the concentration of sugar in the blood which bathes it. La Barre's work, of course, provides considerable evidence that this is the case, but Gayet and Guillaumie, who are also familiar with the somewhat exacting technique of cross circulation experiments, have not as yet been able to confirm these results. La Barre's interpretation of his findings may be correct and it has been rather widely accepted, but in view of Gayet's findings judgment must be reserved. There are many experiments which indicate that the vagus is not essential for the secretion of insulin. Other reviewers have recently covered this field.

A subject which holds considerable interest and which may be considered in conjunction with the liberation of insulin is the insulin content of the pancreas.

An investigation of the factors which influence the insulin content of the pancreas (age, diet, infection, &c.) has been slowly but steadily progressing in my department during the past few years. A method which apparently gives maximal yields has been used and considerable information on the insulin content of dogs' pancreas has been obtained. Severe infections may lower the insulin extractable by this procedure (Waters and Murray). We are not entitled to conclude that the rate of insulin liberation is also decreased, but this may well be the case. Our interest in the effects of duct ligation on the insulin content of pancreas was renewed by the reports of Mansfeld [22] that a ligation of the body of the pancreas in dogs which was followed by degeneration of the tail of the gland resulted in an increase in carbohydrate tolerance. Mansfeld believed that the increased tolerance persisted for several years, and that this depended upon the presence in the body of the degenerated tail of the pancreas. Mansfeld's results have been challenged on several grounds: (1) Nather, Priesel, and Wagner find that the increase in tolerance is only temporary; and (2) de Takats and Cuthbert [23] do not believe that the presence of the degenerated tail is responsible. They did not note any decrease in tolerance

after removal of the degenerated part and therefore attribute the enhanced tolerance, which they also observe, to a greater activity or an increase in the number of islets in the part of the pancreas where the duct system is intact.

This is quite a different situation to that produced by ligation of the pancreatic ducts, which in the dog is followed by an extensive invasion of the whole gland by fibrous tissue. Generalisation on the effects of duct ligation on islet tissue is not permissible since the findings in different species vary, but the islets survive much better than the acini. In dogs, however, many of the islets eventually share the fate of the acini, and four or five months after duct ligation the number may be obviously less than in the normal gland.

In 1905 Diamare reported that oil injections into the pancreatic ducts of dogs eventually produce disappearance of both islets and acini. Allen and Jorns found similar results after ligation of the ducts. It is well established that some of the islet cells hypertrophy in the first few months after duct ligation, but I find no evidence in the literature that the number in dogs increases at any stage. It is probable that the hypertrophy of those remaining is related to the decrease in number. Wogelmuth has stated that the carbohydrate tolerance in these animals eventually reaches a low level, but, on the other hand, there are numerous but less convincing reports of normal dextrose tolerance curves. In the experience of Waters and myself these dogs may become mildly diabetic three or four months after duct ligation.

The most important point is the effect of duct ligation on the rate and extent of the liberation of insulin, and the evidence suggests that these may be decreased. Our own experiments forced us drastically to revise our previous conception that the insulin content of blood could be studied by the methods at present available. However, a method was developed (Best, Jephcott, and Scott) which appears to give optimal yields and which permits the recovery of added crude insulin from pancreatic tissue. Jephcott and Waters in my laboratory have noted that highly purified insulin is not recoverable by this process. The yield may be as large as 5000 units per kg. of dogs' pancreas, and while the product is not easily purified it may be satisfactorily assayed in a relatively crude form. Waters and I find that the insulin concentration remains at a surprisingly high level after duct ligation. The total amount of insulin in the gland diminishes greatly, however, and pancreas from duct-tied dogs is probably not a good source of insulin for the animal. There is certainly no evidence that the insulin content of the pancreas increases under these conditions. It is, of course, not justifiable to conclude from these results that the amount of insulin liberated, or that the rate of liberation, decreases after ligation of the duct. However, when these findings are considered in conjunction with the results of exacting carbohydrate tolerance tests, the eventual onset of diabetes, and the eventual degeneration of the islets, it appears highly unlikely that ligation of the duct of a part of the pancreas will favour insulin liberation from the affected part. It may be possible to obtain direct evidence whether or not the insulin content of the unaffected part of the pancreas is changed by interference with the duct system of the remainder. The increase in tolerance claimed by Mansfeld and by de Takats is not great. de Takats and his colleagues have been commendably cautious in applying the results of their interesting experiments on animals to clinical diabetes, and their experiences will probably not encourage others to try operative procedures.

(*References at foot of next column*)

# MULTIGLANDULAR DISEASE*

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Much as I dislike adding another word to the medical vocabulary, I must do so now, because the hybrid word "polyglandular" can have no place in a lecture to the memory of so sound a classical scholar as the late Dr. Schorstein.

Multiglandular disease means many glands diseased and therefore is not a synonym for pluriglandular disease, which should mean more glands diseased. However, the actual meaning of a name in medicine is not of immense importance, because there is a convention in the way names are used. It is doubtful whether any complaint should be termed uniglandular: Graves's disease, which appears to be primarily a disease of the thyroid gland, frequently has associated with it enlargement of the thymus gland and probably also over-activity of the suprarenal glands. The proof of this overactivity seems to lie in the temporary improvement which follows severance of the nerves. At present the term multiglandular disease is reserved for those conditions in which several internal secreting glands are involved, whilst it is not possible to assert with confidence which gland is affected primarily.

The difficulty in determining which cells are responsible for a disease can be more readily understood when it is realised that a gland may make an excess of its normal product without any increase in its size. Most physicians with experience have seen cases of Graves's disease with great emaciation, tachycardia, protuberant eyes, fine tremors, sweating, and glycosuria without any recognisable enlargement of the cervical lobes of the thyroid gland, and in which X ray examination of the thorax has proved that neither a substernal nor intrathoracic lobe is responsible for the condition. It is true that in these

* An abstract of the Schorstein lecture delivered at the London Hospital in October, 1933.

(*Continued from previous column*)

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cases histological examination leaves no doubt that there is an excessive activity of cells, but this does not apply to some other conditions which appear to be due to excessive production of an internal secretion.

Observations upon spontaneous hypoglycæmia provide a good instance. In this rare disease, in which the concentration of sugar in the blood falls so low as to cause symptoms (symptoms which may be so insignificant as a sensation of apprehension or so serious as homicidal mania), adenomata consisting of beta cells of the islands of Langerhans have been found and the removal of the adenoma has led to recovery. This finding, however, is far from invariable; in some cases simple hypertrophy of the islands of Langerhans has been demonstrated, whilst in others

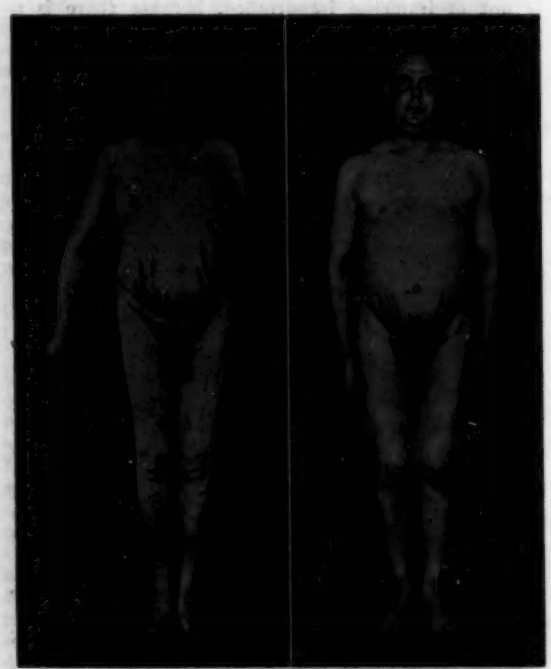

FIG. 1.—On the left: Raab and Krause's case. On the right: Leyton, Turnbull, and Bratton's case.

the most careful examination has failed to discover any tumour or hypertrophy, and removal of a part of the pancreas has not benefited the patient.

It might be argued that in all cases of spontaneous hypoglycæmia an excess of beta cells of the islands of Langerhans would be found if the search were complete, but this can be refuted by the evidence we possess.

The pancreas of the normal individual has the capacity of making sufficient insulin to cause death from hypoglycæmia. This has been shown repeatedly when experiments have been conducted with the object of determining the maximum rate at which the healthy individual is able to store sugar when dextrose is injected into a vein. A short time after ceasing the injection profound hypoglycæmia may develop, requiring the administration of sugar over a considerable period; occasionally hypoglycæmic coma has necessitated the injection of carbohydrate into the rectum. Further evidence exists in those patients suffering from diabetes mellitus, who after having been on fixed diets and doses of insulin for months or even years, suddenly develop intense hypoglycæmia causing coma from which they would never emerge if they were not supplied with liberal quantities of sugar. It may be necessary to continue to give carbohydrate in large amounts at short intervals for days or even weeks after the administration of insulin has been stopped. This seems to show that cells which have been underactive for long periods may awaken to dangerous overactivity.

It is therefore established beyond doubt that hyperinsulism does not necessitate the presence of an excessive number of the beta cells of the islands of Langerhans.

It may help us to understand multiglandular disease if we accept the principle that a gland producing an excess of its normal secretion or even an abnormal secretion need not necessarily show any morbid change recognisable by present-day methods.

## MULTIGLANDULAR DISEASE AND PITUITARY BASOPHILISM

The functions of the pituitary gland are so numerous that as its mystery was gradually unfolded it appeared that the explanation of multiglandular disease would be elicited and the name replaced by "basophilism." Indeed at one time Harvey Cushing[1 2] tended towards that view, because he had collected many cases of the syndrome which had been associated with an excess of basophil cells in the anterior part of the pituitary gland. This view he has modified since cases have been recorded with similar syndrome but lesions in tissues other than the pituitary gland. I yield to no man a greater admiration for the work of Prof. Cushing, and later shall refer to some of the benefits his investigations have bestowed upon patients suffering from multiglandular diseases. It is in no antagonistic spirit that to-day I refer to cases of multiglandular disease due to lesions outside the pituitary and compare them with cases in which either basophil adenoma of the pituitary has been demonstrated or which have signs which place the diagnosis almost beyond doubt.

### I

The first pair (Fig. 1) consists of two men, one described by Raab[3] with autopsy by Krause,[4] and the other a case which was in one of my wards with an autopsy by Turnbull and Bratton.[5]

They both developed their diseases in their thirty-second year; both showed septic foci shortly before the end; both were of more than the average height and the legs of both were long compared with the trunks. The external genitalia were normal but both became impotent. The faces and abdomens were obese and the legs slender. Broad purple lineæ atrophicæ radiated from the pubes over the abdomens, probably due to their rapid gain in weight. The main differences which might have been noted during life were that Raab's patient had backache probably caused by kyphosis resulting from osteoporosis. There was no evidence of osteoporosis in my case. In Raab's case the sella showed that the space was becoming larger; in the London Hospital patient the sella appeared to be normal, but he developed hyperglycæmic glycosuria whilst under observation. At the end of November, 1927, his sugar tolerance appeared to be normal, but by the following January the sugar content of his blood after a fast was 0·20 per cent. The blood contained 5,100,000 red cells and 88 per cent. hæmoglobin, proving an absence of polycythæmia which is not an uncommon feature of pituitary basophil adenoma; on the other hand, his blood pressure was 170 mm. Hg. Hypertension is found in the majority of cases of basophilism.

The lesions found at the autopsies were strikingly different. The only common finding was enlargement of the thyroid gland. Krause found an adenoma of the pituitary gland consisting chiefly of basophil cells; there was definite osteoporosis; the suprarenal

glands had undergone autolysis. In the London Hospital case Turnbull and Bratton found a tumour of the thymus gland which upon histological examination was shown to consist of oat cells and secondary growths in the lungs. The suprarenal glands were greatly enlarged, the cortex more than the medulla. Serial sections of the pituitary gland stained with special methods failed to show any excess of basophil cells.

II

The second pair of patients were a girl who was comparatively recently under the care of Prof. Cushing and a boy who was in one of my wards in the latter part of 1927.

FIG. 2.—On the left: Cushing's suspected case of basophilism. On the right: Case of primary cancer of thymus.

The most striking similarities in these cases are the excessive growth of hair upon the face and the protuberance of the abdomen. Both faces became rather bloated through abnormal deposition of fat (Fig. 2). The photographs show excessive hair in both cases—an excess on the upper lip, the chin, and at the sides of the forehead. I shall quote Prof. Cushing's words in the description of the girl.

"There was precocious adolescence, at 10 years of age, associated with normal menses which continued for three years and then abruptly ceased. . . . She acquired a peculiar plethoric appearance with an abnormal growth of hair on the brows, lip, and chin. . . . She became increasingly abdominous with progressive increase of the purplish striæ atrophicæ" (Fig. 3).

"She had persistent backache and became round shouldered with the loss of 4 cm. in measured stature due undoubtedly to the roentgenologically evident decalcification of the vertebræ and abnormally high calcium elimination. . . . A spontaneous fracture of the pelvic bone, evidently in a tumour, has healed with callus formation. . . . She had a subnormal basal metabolic rate, a lowered tolerance for carbohydrates, and a high blood pressure, presumably indicating secondary involvement or imbalance of other glands—parathyroid, thyroid, pancreatic islets, and adrenal—to almost any of which the syndrome might have been ascribed. . . . Her urine tested by two observers on both rabbits and immature mice proved to contain follicular-stimulating substance indistinguishable in its effect from prolan."

FIG. 3.—Cushing's case (October, 1932) showing abdominal protuberance.

FIG. 4.—Case of cancer of thymus, showing abdominal protrusion.

This patient did not die and therefore the morbid conditions associated with the syndrome have not been placed beyond doubt, but the probable cause may be deduced from the subsequent history which I postpone relating until I have described the parallel case.

The boy, aged 11, had had his appendix removed quite recently in a surgical ward of the London Hospital by Mr. E. C. Lindsay and had made an uninterrupted recovery. Whilst he was at the convalescent home, sugar was found in his urine and his abdomen became protuberant. His facial expression altered so greatly in three weeks that he was not recognised by the sister of the ward in which he had been for the operation. His face was fat and the skin over his cheeks was stretched. He had developed a moustache, with some hair on his chin which formed a meagre imperial, his eyebrows were thick and plentiful, and there was an excess of hair on the sides of his forehead. His legs were long when compared with his trunk, the abdomen protuberant, and the limbs thin (Fig. 4). The genitalia were normal for the age, there was no hair in the axillæ nor on the pubis. He did not develop polycythæmia, nor was his blood pressure above the average normal—conditions comparatively common in basophilism.

Hyperglycæmic glycosuria appeared quite early in this case. Skiagrams of the skull did not show any abnormality of the sella turcica nor any areas of decalcification of the calvarium. It was thought that

the diagnosis lay between disease of the pituitary gland and hypertrophy of the suprarenal cortex. Since the patient had hyperglycæmia and skiagrams did not show any displacement of the kidneys I decided that an exploratory operation was not justifiable. The treatment consisted in controlling hyperglycæmia by diet and insulin. When fully controlled he was allowed to leave hospital, but he returned fourteen days later because he had developed severe headache and polyuria. Early in the morning of the day he was admitted he had had a fit. One of the subsequent fits was described by my house physician, Dr. O. Thomas, in the following words:—

Fits started by slow tonic movements of the left arm and a slow flexion of the left elbow followed by extension. Then the right arm held very rigidly in flexion was drawn up in the front of the chest. The eyes followed by the whole head turned slowly to the left. The left side of the face drawn up. The whole body passed into tonic contraction for about 15 seconds. The pupils were dilated and fixed. The patient became cyanosed. Clonic spasm of all four limbs followed for about one minute, the arms being held in flexion, the right leg was flexed, and the left extended. The position of the legs differed somewhat in different fits.

The pulse was rapid, 120 during the fits. On cessation of the spasm the patient lay quietly and breathed stertorously. The plantar reflex was extensor on the right side and normal on the left side. The urine contained sugar and a trace of albumin. The sugar content of the blood during a fit was 0·25 per cent. and the urea content 0·051 per cent.

These observations make it unlikely that the fits were due to either hypoglycæmia or uræmia, unless one takes the view that so-called hypoglycæmic fits are not due to the lack of sugar in the blood but to a toxic decomposition product of glucose which is usually dependent upon the sugar in the blood falling extremely low. Examination of the cerebro-spinal fluid failed to show any abnormal content.

As already stated, the similarity in these two cases was the excess of hair upon the face, the increase in the size of the abdomen, and the diminished tolerance for carbohydrates. That the girl suffered from basophil adenoma of the pituitary gland seems probable because she improved immensely after irradiation of the pituitary (Fig. 5), and because the gonadotropic substance present in the urine disappeared under such treatment.

FIG. 5.—Cushing's case. On left: Condition on August 12th, 1932. On right: Condition on March 11th, 1933, after irradiation of pituitary gland.

FIG. 6.—Turney's case.

The autopsy of the boy was performed by Dr. Bratton and the tissues were examined by Prof. Turnbull. The pituitary gland was examined in serial sections with a special staining which proved that it did not contain an excess of basophil cells. On the other hand, as in the case described above, an oat-celled cancer was found in the thymus, with secondary growths in the lungs. In this boy, too, the thyroid was hyperplastic and the suprarenal glands hypertrophied, the size of the capsules being relatively greater than that of the medullæ. The cause of death was not demonstrable at the autopsy, and it was suggested therefore that it might have been due to hypoglycæmia. Arguments against that view have been stated above.

## III

A third pair which may be compared consist of the case described by Turney [6] in 1913 and one under the care of Kepler [7] at the Mayo Clinic comparatively recently. Turney described his case very graphically, and all interested in the syndrome should read his description.

The patient, an unmarried woman aged 25, enjoyed good health until suddenly menstruation ceased and

she began to put on weight rapidly. She had noticed that for two years her legs bruised with undue readiness. Her great trouble was pain in the back due apparently to a kyphotic curve in the upper thoracic region. Although she had a subnormal temperature she preferred cold weather to hot. Her mental condition was normal. Her height diminished from 5 ft. 2 in. to 4 ft. 11½ in., the result no doubt of increasing kyphosis.

The face was florid and fat, the hair dry and scanty. The expression was bright and the manner alert. The skin was dry but not harsh. Axillary and pubic hair was scanty, but there was an excess of hair all over the back. The mammæ were pendulous and the abdomen had the contour of a full-time pregnancy (Fig. 6). Numerous broad lineæ atrophicæ were visible over the abdomen and thorax. The legs were very thin, especially the thighs. Skiagrams of the skull suggested enlargement of the sella turcica. The blood pressure was 200 mm. Hg. Examination of the eyes suggested that there had been small retinal hæmorrhages. The red cells rose at one time to over 8,000,000 per c.mm.

The patient later came under the care of Dr. Parkes Weber [8] and he reported that she had several spontaneous fractures. Abscesses led to death seven years after the beginning of the disease. The autopsy revealed chronic nephritis, fatty infiltration of the liver, and an enlarged left suprarenal gland with a bulky cortex. Nothing abnormal was noted in the pituitary or thyroid glands.

The autopsy was in 1914, long before the small basophil adenomata had been described, but it seems probable that this case was one of basophilism. Kepler's case, on the other hand, although in many respects the signs were similar, proved to be one of cancer of the thymus.

Her last illness began in January, 1932, when she was 46 years old. Before that she had had two operations upon the thyroid, appendicectomy, and drainage followed by removal of the gall-bladder. She stated that she had always had a slight growth of hair on her face, but that it had been insignificant until January, 1932, when it grew rapidly and made shaving daily necessary. At the same time her face became fat and florid. In June, 1932, she developed intense hyperglycæmic glycosuria and hyperthyroidism. Her menstrual periods had ceased at the beginning of the illness. Her legs became thin and weak. The blood pressure averaged 170 mm. Hg systolic and 80 diastolic. A small hæmorrhage occurred in the left retina. The sella turcica was normal upon roentgenographic examination. There were metabolic disturbances leading to alkalosis and also to a fall in the chloride ions in the blood with a fall in the calcium content.

FIG. 7.—Case in the London Hospital.

The skull was irradiated with apparent temporary improvement.

At the end of June, 1932, she died. Autopsy disclosed a normal pituitary gland both grossly and on microscopic examination of serial sections with special stain. A thymic tumour about 5 cm. in diameter was present. Both suprarenal glands were hyperplastic with a combined weight of 49 g. There was a small abscess in the pancreas. The thyroid showed multiple degenerating colloid and fœtal adenomata in a colloid thyroid with intra-adenomatous parenchymatous hypertrophy.

## IV

A fourth pair for comparison are of less value because the diagnosis in one of the cases has not been established by the morbid pathologist. One of the cases was recorded by Dr. Hurst Brown [9] some six years ago, and the other is still under my care. Dr. Hurst Brown described his case as follows.

A woman, aged 45, complained of thirst, disinclination for food, weakness and numbness of the legs, blurring of vision, and sinking sensation in the pit of the stomach. The onset of the disease was menorrhagia, for which she had hysterectomy. When admitted to hospital her face was florid and pigmented, the breasts and chest were also pigmented. Her weight was 12 st. 8 lb.; in other words, she was obese. The urine contained sugar and the reaction to insulin was irregular. X ray examination failed to show any alteration in the pituitary fossa. She became bald but grew hair on the chin and upper lip. She did not develop striæ atrophicæ.

The autopsy revealed a typical oat-celled cancer of about 1 cm. diameter in the lungs. There was hyperplasia of the thyroid gland. The suprarenal cortices were enlarged. The pituitary gland was enlarged and much colloid was found in the large vesicles in the intermediate lobe.

This case may have been one of basophilism with cancer of the lung; but it simulated closely the cases of primary cancer of the thymus and the microscopic appearance of the cells was very similar too.

The other case is a woman presenting many of the characteristics of basophilism. Fig. 7 shows the protuberance of the abdomen, the hypertrophy of the breasts, the absence of fat over the gluteal region, the slender legs, and moderate kyphosis. The patient has hyperglycæmic glycosuria controlled by insulin. She has had her pituitary region irradiated, but the hyperglycæmia has persisted although she reports that she is feeling better.

### CONCLUSION

Four cases of multiglandular disease have been outlined which have apparently been due to new growths in tissues other than the pituitary gland; in three of these the primary growth was in the thymus, whilst in one a growth of similar cells was found in the lungs.

At least 14 cases of multiglandular disease associated with basophil adenoma of the pituitary gland have been recorded. The various internal secreting glands involved were—

| | Basophilism. | Neoplasm elsewhere. |
|---|---|---|
| Thyroid .. .. .. | 3 .... | 4 |
| Suprarenal cortex .. .. | 8 .... | 4 |
| Parathyroids .. .. .. | 2 .... | — |
| Osteomalacia .. .. | 5 .... | 1 |
| Thymus .. .. .. | 0 .... | 3 |

I fear that the data are quite insufficient to draw any conclusion as to the cause of multiglandular disease. Too often the theorist in his study suggests explanation of disease which is proved incorrect by the investigator in his laboratory. It is therefore with all due humility that I suggest further investigation of the suprarenal cortex with new stains which may perhaps show that it consists of cells of slightly

different morphological character secreting different substances. Hyperplasia of the suprarenal glands often causes virilism or precocious development of the reproductive organs. In three cases there was great hypertrichosis without virilism. Overactivity of the suprarenal cortex seems to account for the symptoms most satisfactorily. Since Collip [10] has been able to isolate an adrenotropic substance from the pituitary gland it seems within the bounds of possibility that the excess of basophil cells produces an excess of this hormone. Whether other tissues can produce an adrenotropic substance or whether the neoplasms of the cases referred to above stimulate the basophil cells in the pituitary to excessive secretion without causing hyperplasia remains a problem which no doubt will be solved in the near future.

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## THE USE AND ACTION OF HISTAMINE IN RHEUMATISM

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IN recent years histamine has been used in the treatment of rheumatism and good results have been recorded, chiefly by continental workers. In 1931 Deutsch [1] demonstrated the use of this substance before the Berlin Medical Society and reports of its use have since been published by Kaufmann,[2] Bettmann,[3] Schenck,[4] and recently by Govaerts.[5] Each of these workers administered histamine by ionisation. Ravina,[6] reviewing the use of histamine, states that Jacchia [7] has given it by subcutaneous injection. Although the subject has received considerable attention, no full account of the use and action of this drug in rheumatism has yet appeared. There is also marked difference of opinion as to the type of case which is suitable for this treatment.[8 9 8]

### METHOD AND RESULTS

We have studied the effects of histamine and thio-histamine * in the treatment of a series of 70 adult cases of chronic rheumatism and allied disorders. The series included examples of rheumatoid arthritis, fibrositis, osteo-arthritis, subacute rheumatism, and gout. It was not possible to withhold other treatment (physiotherapy) from these patients; nevertheless the results due to histamine could be easily recognised by the time relation which they bore to the injection.

Histamine was given by subcutaneous injection. The solution was prepared in the strength of 1 mg. of histamine acid phosphate to 1 c.cm. of saline and 0·5 per cent. phenol was added as a preservative. The initial dose was 0·1 mg. (i.e., 0·1 c.cm.), and this was increased daily by 0·05 mg. until definite improvement was observed. A satisfactory dose was usually found to lie between 0·1 and 0·5 mg. This dose was repeated two or three times a week and further increased if the response diminished. We were not usually able to treat patients for longer than four weeks, but there does not appear to be any reason why this treatment should not be continued indefinitely. We found that the sensitivity to histamine varied in different individuals, and women were usually more sensitive than men. As a result the optimum therapeutic dose had to be determined in each particular case. Moreover, the optimum dose did not always remain constant as in some cases slight tolerance was developed. When the interval between doses was long (e.g., a week), some increased sensitivity was occasionally observed.

Thio-histamine was given by intramuscular injection and was found to be less potent than histamine. This substance was obtained in ampoules containing 1, 2, or 3 mg. The initial dose was 1 mg. and this was increased daily by 1 mg. until a satisfactory dose (which was usually between 2 and 6 mg.) was found. The injection was repeated two or three times a week as described in the case of histamine.

We found that histamine could produce benefit in examples of all types of rheumatism, but a certain type of case was particularly amenable to this treatment. This type was characterised by the coexistence of impaired grip, the result of periarticular arthritis in the hand, with vasomotor symptoms (e.g., cold and cyanotic fingers). Incidentally, some of these had previously proved resistant to physiotherapy. There were, of course, individuals who derived no benefit from this treatment. These were chiefly patients in whom symptoms of circulatory disorder were absent.

The heart was examined and the blood pressure taken in the case of each subject. We regarded as unsuitable cases with gross heart disease or high blood pressure. Whenever possible the patients lay down for 15–30 minutes after the injection to diminish the liability to headache and dizziness which sometimes occurred. Care was taken to avoid chill if a transient rise in temperature occurred as described below. Histamine in the doses mentioned did not affect menstruation. As an extra precaution adrenaline, the physiological antidote to histamine, was at hand. We may add, however, that we never had occasion to use it. Observations were made upon the body temperature, pulse- and respiration-rates, blood pressure, and surface temperature (by the thermo-couple and galvanometer method).

The following account of the effects of histamine on rheumatic patients applies equally to thio-histamine given in appropriate doses. The response to histamine varied from patient to patient, and even in the same patient at different times. The following is a list of all the effects which were observed: flushing, relief of pain, increased range of joint movement, relief of vasomotor symptoms, sweating, headache, dizziness, drowsiness, increased appetite, a sense of well-being, changes in blood pressure and temperature, and paræsthesiæ.

*Flushing.*—Although relief of symptoms is the most important of these phenomena therapeutically, flushing appeared first, was the most constant and was often striking. It generally occurred within a few minutes of injection, and lasted from fifteen to thirty minutes. With the smaller doses the flushing was confined to the face and neck. With the larger doses flushing was accompanied by erythema and a feeling of warmth over the whole body, but there was generally an interval between the facial flush and the occurrence of general bodily warmth. Sometimes the flush had a patchy or mottled distribution over the face and neck. In a number of cases flushing recurred later in the day, either without obvious cause or evoked by some stimulus such as a hot drink.

*Relief of pain and increased movement.*—Pain was relieved and movement of joints increased, often to a surprising degree. This occurred in a few minutes. Occasionally, a few hours, and more rarely a few days,

* The British Drug Houses Ltd.

elapsed before improvement appeared. The response was frequently dramatic. For example, a patient unable to close his hand owing to limitation of finger flexion would close the fist completely within a few minutes of the injection. Again, a knee-joint would be fully extended after having been partially flexed for years. In some cases definite relaxation of muscular spasm occurred, and this was most strikingly demonstrated in the case of the sternomastoids. It is necessary to point out that dramatic increase in movement did not as a rule last longer than a few days. The benefit, however, did not entirely disappear, a small but definite improvement persisting, to be added to by the effect of subsequent injections.

*Relief of vasomotor symptoms.*—Vasomotor disturbances were common and consisted of sensations of coldness in the extremities or all over the body, and pale or cyanotic hands, with or without trophic changes. Histamine relieved these symptoms in almost every case. A sensation of body heat was frequent. This occurred soon after the flushing of the face and even when erythema was not visible. After a few hours it would subside, a lesser degree of warmth often persisting for several days. We have frequently seen both cyanotic and deathly pale hands rapidly take on a healthy pink colour and perspire freely, the patients declaring that they feel "alive" and warm again.

The remaining effects which may follow an injection of histamine, although less important therapeutically, are of considerable interest from the physiological point of view.

*Headache and dizziness.*—A slight degree of fullness in the head or headache with or without dizziness was not uncommon, and lasted from a few minutes up to half an hour. Occasionally it would begin with violent throbbing and persist as a dull ache for several hours. It was not directly proportional either to the size of the dose or to the amount of flushing: a marked flush was sometimes followed by no headache at all, and a slight flush by a marked headache. It was not usually sufficient to cause undue inconvenience, but when necessary was easily relieved by aspirin. The headache and dizziness, when they occurred, were generally felt within a few minutes, but in a number of cases there was a latent period of many hours. They could generally be mitigated if the patient lay down for half an hour after the injection.

*Sweating.*—Sweating occurred less commonly than the effects already described. It usually appeared within a few minutes of injection and frequently was localised to the palms of the hands. More rarely the onset of sweating was delayed for some hours, occurring perhaps during the night, sometimes profusely.

*Drowsiness.*—Patients often experienced a feeling of drowsiness within several hours. As a rule this was slight and of short duration. In a few cases the drowsiness led to a strangely deep sleep, from which the patient awoke after a few hours very refreshed.

*Appetite and well-being.*—A sense of well-being was frequently noted. When the injection preceded a meal there was occasionally a marked increase in appetite. These effects rarely lasted longer than one or two days.

*Blood pressure.*—With histamine a fall in blood pressure commonly occurred to the extent of 20–40 mm. Hg, but this never lasted longer than five minutes. In cases complicated by high blood pressure the fall was greater. With the smaller doses of thio-histamine the blood pressure was only rarely affected.

*Temperature.*—A rise in mouth temperature up to 1·5° F. was often recorded. In a few cases, however, the temperature fell. A typical chart shows that the maximum change occurs within half an hour and the temperature returns to normal fifteen to thirty minutes later. These findings were quite inconstant. We found that not infrequently the mouth temperature varied as much as 0·5° F. between successive readings taken at five-minute intervals, apart altogether from the administration of histamine. This led us to observe the temperature at intervals of a few minutes before as well as after the injection. Our remarks apply only to those observations which were thus controlled. The skin temperature of the cheek rose considerably and in one case approximated mouth temperature.

*Pulse and respiration.*—The pulse-rate was as a rule either unchanged or slightly increased. The respiration-rate was never affected.

*Paræsthesia.*—Some kind of paræsthesia was occasionally met with. This took the form of tingling or burning in various parts of the body. It was always transient and caused no discomfort.

Apart from the needle prick the injections were painless, and untoward symptoms never arose.

#### CASES ILLUSTRATING THE EFFECTS OF A SINGLE INJECTION

Woman aged 41; rheumatoid arthritis 18 months' duration. Walked with two sticks on account of flexion of the knees. Sixth injection, 10 A.M., 5 mg. thio-histamine intramuscularly. Within a few minutes, slight flushing of the face and warmth of body occurred. In twenty minutes the patient felt looser behind the knees, which showed increase in movement. Walking was markedly improved. No headache, but slight drowsiness all day. The following morning the improvement had largely disappeared. A small but definite benefit, however, persisted. In this case the mouth temperature rose 1° F. within fifteen minutes and returned to normal fifteen minutes later. No acceleration of pulse or respiration.

Man aged 59; fibrositis and arthritis of many years' standing. Swelling of small joints of fingers and pale clammy hands; unable to close fists completely; always feels cold and says "nothing ever warms me." Second injection, 11 A.M., 0·15 mg. histamine subcutaneously. Face flushed and body felt warm. The hands also became warm, the colour changing from white to pink, and he was able to close his fist completely for the first time in many months. These effects occurred within a few minutes of the injection and had not disappeared four days later, when the next injection was given. He also experienced general well-being and a temporary increase in appetite.

#### IONISATION

The administration of histamine by ionisation was first introduced by Deutsch in 1931,[1] and has recently been described in detail.[2] The positive pad is soaked in a 1 in 5000 solution of histamine. A treatment usually lasted twenty minutes, and at the end of this time the skin under the positive pad was red, hot, and usually blistered. We found that therapeutic effects were purely local and were apparently the result of local galvanism, heat, and counter-irritation. Pain and swelling were relieved in all types of cases. The most striking results were obtained in cases of chronic arthritis of knee and ankle joints which had recently flared up with increase of swelling. With regard to general effects, flushing of the face and headache often occurred but general therapeutic effects were absent.

We wish to express our thanks to the honorary physicians of the Harrogate Royal Bath Hospital for their interest and encouragement throughout this work. Also to Prof. B. A. McSwiney, of the University of Leeds, for helpful advice and criticism. One of us (C. G. E.) is in present tenure of the Worswick fellowship of the University of

Manchester. Some preliminary work was done in the clinical research department of that University, and thanks are due to the director, Dr. J. F. Wilkinson, for continued interest.

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# THE CLINICAL APPLICATION OF HISTAMINE IN RHEUMATISM

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HAVING been one of the first to employ histamine as a routine treatment for various rheumatic conditions, it may be of interest to explain its clinical application. In a recent note by Bisset and Woodmansey[1] the theory and the results of various investigations were set forth, but there is perhaps need for a fuller description of the practical findings.

It is essential that a suitable type of case be selected for treatment, such being osteo-arthritis, rheumatoid arthritis (not in the acute stage), chronic villous arthritis, fibrositis, and neuritis. An opportunity of observing the reaction of the gouts has not occurred, but other writers[1] have reported good results. Similarly, its use has been proved in intermittent claudication,[2] and in muscular atrophy due to trauma and disuse.[3] It has no place in the treatment of infective arthritis or acute rheumatoid arthritis, or where there is marked failure of compensation in the heart.[4]

The course of the disease in most cases appears to be uninfluenced[5] by histamine, but there is no doubt that its use accelerates recovery from those conditions which can definitely be cured, such as fibrositis and neuritis. In a long series there have been extremely few failures, a result which can in the main be ascribed to two causes—namely, careful selection and personal application of the treatment. The method is one requiring such unremitting attention to every phase, on account of the daily variations in the reaction of the same patient, that it does not seem practicable to delegate the administration, in the form of a prescription, to a second person. But if these two requirements are satisfied, and if the use of histamine is combined with suitable bath treatment, the results unquestionably surpass those obtained with previous methods.

The histamine which has been used is that prepared by Hoffmann-La Roche in the form of tablets and electrolytic ointment. The tablets, which are used for making a stock solution of the required strength, were early discarded in favour of the ointment, which seemed to give better results and was much more convenient to use. At the present time it is employed in two ways: ionisation and massage.

## IONISATION

The affected part is smeared with ointment without any preliminary cleansing. The use of benzene has been advocated by Spicker,[2] but after an extensive trial there seemed to be no advantage in removing the surface grease, and this has been discontinued. A lint pad, wrung out of saline, is placed in the usual way over the part and connected to the anode of the apparatus. A similar pad, connected to the cathode, is applied to the body either in an indifferent place or with the idea of getting a definite "through and through" effect, although the advantage of this has not been proved. The amount of current used vastly exceeds that advocated by other workers, who rarely go beyond 15 milliampères, whereas I always give each patient the maximum which can be tolerated, and this frequently amounts to 100 and 150 ma. The current is raised to the maximum as rapidly as may be compatible with comfort, and is maintained at the greatest height the patient will allow during the remainder of the sitting, being at the end of that time cut off without hesitation.

The amount of current which a patient will tolerate varies enormously from day to day, and unless the maximum current is given for each sitting the greatest benefit is not being received. The amount of current passed does not seem to bear any relationship to the size of the pads, except where a very small area is being treated, when there is naturally a concentration. The patient immediately announces a tingling and intense itching at the site of the anodal pad, and this may gradually increase, may remain stationary, or may rapidly lessen. It is frequently noticed that these symptoms pass off as the current is increased. There is an accompanying feeling of local warmth, and the patient must be told how to distinguish between this and the burning caused by the concentration of the current in one spot. He is told also to complain at once if the limb begins to throb, if the face flushes, or if there is pain in the head. The flushing of the face must, however, be looked for by the operator from the passing of the first milliampère, frequently becoming apparent a few moments before the patient realises its presence, and those few moments may mean the avoidance of a bad headache, as it is on the first suspicion of a flush that the current is cut off. This may take place after three minutes or not until 20 or 25 minutes have passed.

When the patient complains of throbbing or excessive heat the current is reduced the necessary amount to stop these phenomena. When the current is cut off a well-marked urticaria is found under the anodal pad, corresponding to it in size or irregular in shape; it may be discrete or may have coalesced to form a raised plateau. There is violent itching, which is allayed by dusting with talcum powder and usually passes off in a few minutes to half an hour. The rash itself often fades rapidly and has not been found to remain longer than 130 minutes. It is advisable where possible completely to surround the part with the anodal pad, and an arm or foot bath can be used as the positive electrode for treating an extremity which has been well smeared with the ointment or can be used to replace the cathodal pad.

With the treatment the patient experiences an immediate relief from pain, either complete or partial, and can demonstrate a greater range of movement where previously there was restriction. This lessening of pain is always present and may last a few hours, a few days, or permanently. In addition, there is a feeling of local warmth and general well-being. The undesirable results which must be carefully watched for include headache or a feeling of fullness in the head, tachycardia, a feeling of constriction in the chest with consequent breathlessness, burning, and faintness, any one of which is an indication for the immediate cessation of the sitting. Treatment may be given daily.

## MASSAGE

The ointment has given excellent results when used as a basis for massage in fibrositis and chronic villous arthritis, but in these cases it is necessary to make allowance for the natural benefit resulting from the massage alone. There is, however, no doubt that the addition of histamine produces

markedly superior results.[6] In a few minutes patches of urticaria appear, but they rarely exceed the size of a split pea and are not usually numerous. Symptoms of toxicity likewise are seldom seen. On the whole results are less satisfactory than when ionisation is used, but where massage is desired histamine can advantageously be employed, and it may safely be used in cases of failing compensation which cannot have ionisation. It has not been observed with Spicker[2] that "the greatest rash appears in the painful areas while those not affected hardly react." Neither the practice of scarifying the skin before inunction as advocated by Vas,[7] nor the method of injecting histamine peri- or intra-articularly by the technique of Vezér,[4] Faber,[8] and Jacchia [3] have been attempted, mainly because the results by other methods have been eminently satisfactory. A preliminary exposure to infra-red rays appears to be beneficial.

### ILLUSTRATIVE CASES

CASE 1.—Fibrositis, mainly in back and knees. Duration 15 years. Patient had always received benefit from spa treatment, but returned each year in the same condition. In 1932 there was considerable improvement with various baths, douches, and massage, but on returning in 1933 was found to have relapsed. Again had baths, massage, and infra-red radiation, but was making no progress. Was given ionisation with histamine to the lumbar region for 10 minutes, current up to 45 ma., and at the conclusion of the application was found to be free from all pain in the back, and similarly at the next two sittings the knees were also painless. Treatment was repeated on five further occasions. Now, six months later, the patient reports that there is still freedom from pain and that she has not felt so fit for many years.

CASE 2.—Neuritis of traumatic origin, duration two months, caused by playing badminton. When seen there was slight loss of extension of the right elbow, with considerable neuritic pain, aggravated by attempts to extend the joint. Ionisation with histamine was given on seven occasions, each time with a further reduction of pain and an increasing range of movement. Where the intervals between the treatments were unusually long (four to five days) there was some tendency to retrogression, but the ultimate result was a complete and so far permanent restoration. Two other similar cases have given equally good results, one of them requiring only three sittings.

CASE 3.—Fibrositis and chronic villous arthritis. Long history with periods of remission following spa treatment, but gradually getting worse. Complete freedom from pain in knees with one treatment, the first time they had been painless for years. One knee has now remained free from pain for six months, but the other has relapsed owing to a fall and now is having daily either ionisation or massage with histamine. There is a very gradual improvement. In the same case a very severe fibrositis of the entire back is likewise yielding to similar treatment, but this is a case in which repeated applications appear to be required, something like 200 treatments having been given to the back and knee. After each sitting there is definitely a decrease in the pain, but there has not been the dramatic result which is got in the majority of cases.

CASE 4.—Osteo-arthritis of the left hip. Long history with much treatment at various places, but never freedom from pain. Completely free from all pain after the first application by ionisation, and could demonstrate the improvement by climbing stairs properly for the first time in many years. Was given seven further treatments and now, after four months, reports a continuance of the benefit.

### CONCLUSIONS

(1) Histamine has a definite place in the treatment of fibrositis and neuritis, and in all chronic rheumatic affections associated with pain and limitation of movement. (2) With histamine it is possible completely to cure fibrositis and neuritis, and almost invariably to decrease or remove joint pains in other suitable cases. (3) The process of ionisation with histamine requires unremitting attention during the whole of the sitting and, even more important, the tolerance of a given patient both as to time and milliampèrage varies greatly from day to day.

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# Clinical and Laboratory Notes

## RETROPERITONEAL CYST

BY H. L. GREGORY, M.B. Camb.
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L. M. MAYERS, M.R.C.S. Eng.
PHYSICIAN TO THE HOSPITAL

A MARRIED woman of 31, nullipara, after 21 months' amenorrhœa, consulted one of us (L. M. M.) on account of abdominal pain of a flatulent griping character, which was aggravated since she had taken aperients.

She was found to have an abdominal tumour as large as a six and a half months' pregnancy. It was median in position, pyriform in shape, elastic in consistence, with no evidence of fœtal parts to be detected, and arose from the pelvis. Vaginal examination disclosed the fact that the uterus was in front of the tumour, which extended into Douglas's pouch and felt definitely cystic. There had been none of the subjective signs of early pregnancy, and the cervix uteri was not softened; the question of extra-uterine pregnancy was dismissed from consideration and a diagnosis of ovarian cyst was confidently made.

She was admitted to Hornsey Central Hospital, and after the usual preparation the abdomen was opened by para-median incision. Attempts to deliver the cyst on to the surface were completely frustrated by the colon, which was tightly stretched and closely adherent over the front of it from the right iliac fossa to the splenic region. In the belief that it was the transverse colon separation was begun from below, dividing what appeared to be peritoneal adhesions and swabbing the bowel upwards, but there was so much bleeding from the vascular subperitoneal tissues that this could not be continued. The cyst was therefore tapped and emptied. The content was about 3 pints of dark chocolate-coloured slimy fluid, suggesting that recent hæmorrhage into it had caused the rather sudden onset of symptoms.

The cyst was unilocular, and after emptying, its wall became obvious and it easily shelled out of its surroundings, having no connexion with either ovary. When it was gone, we found that instead of transverse colon we had been dealing with the sigmoid loop, whose vascular supply passed upwards on the left face of the cyst, and that now there was about a foot with no mesenteric attachment. Resection and end-to-end anastomosis were done, and as the patient's condition was becoming bad, done very hastily. During the suturing pulse and respiration were imperceptible and the abdomen was quickly closed, after running an œsophageal tube per rectum to 6 in. above the anastomosis. By this time the assiduous efforts of the anæsthetist were rewarded, and she went back to the ward with a pulse of 160.

Subsequent progress was anxious, but steady. Saline solution was given by drip through the inserted tube for 48 hours. She was then able to sip ʒii–ʒss. For eight days she had nothing more by mouth than fruit juice, glucose, Russian tea, and paraffin, and during the first

12 days she passed fæcal fluid by the tube, which was then extruded. She has had no symptoms of obstruction nor any other trouble since.

No ovarian tissue was found in the cyst wall, which was uniformly thin. The lining epithelium was not microscoped. The cyst may have arisen from the parovarium and lifted the posterior layer of the broad ligament and pelvic peritoneum as it increased; if not, its origin is obscure.

## AN UNUSUAL REACTION TO NIRVANOL

By CHARLES S. D. DON, M.D. Aberd., M.R.C.P. Lond.

HONORARY PHYSICIAN TO SALFORD ROYAL HOSPITAL AND TO THE ROYAL EYE HOSPITAL, MANCHESTER

THE treatment of chorea by phenyl-ethylhydantoin was introduced by Roeder [1] in 1919, and numerous papers dealing with this have appeared in English medical literature.[2–9] This drug, better known as Nirvanol, gives rise in many cases to a morbilliform rash, pyrexia, and a rise in the pulse-rate; sometimes, as mentioned by Poynton and Schlesinger,[3] cervical adenitis, drowsiness, conjunctivitis, pharyngitis, slight œdema of eyelids and face, and headache may also be observed. Ashby [6] has observed incontinence of urine. The temperature may even rise to 104° F. and remain so for four to five days, and at times, as in the case reported by Sehestedt,[10] a secondary rash may appear when the patient is convalescing from the typical nirvanol rash. Lesigang [11] and Whitaker [9] were able to induce a mild pyrexia and a rash in cases which had had nirvanol previously by giving a single dose to such patients. Murray-Lyon,[2] Lesigang,[11] and others have observed idiosyncrasies to nirvanol, and Keller [12] reported a case with high fever, headache, scarlatiniform rash, swelling of face and mouth, enlargement of spleen and liver, jaundice, and diarrhœa. Jones and Jacobs [7] had one case which became comatose, with bleeding from the nose and gums and a pyrexia lasting 11 days, the temperature rising to 101° F.

In the large majority of cases nirvanol in ordinary doses may be used with confidence and without fear of ill-effects. In the case here reported the patient appears to have had an idiosyncrasy to nirvanol and the temperature rose to an unexpected height and persisted for nearly three weeks.

This patient, a girl of 11 years, who had never had nirvanol previously, was suffering from chorea of moderate severity; she was of average height, slightly under the average weight, and she had a well-marked mitral presystolic murmur. She was given 0·3 g. of nirvanol on Jan. 9th and again on the 10th, and on the 11th a scarlatiniform rash appeared on the chest, the face was flushed, and the temperature rose to 102·4° F., the rise lasting two days. Six days later, as the choreic movements had improved to some extent, she was again given 0·3 g. of nirvanol on three successive days, when it was stopped as a scarlatiniform rash had reappeared; the temperature rose to 103·6° F. The rash lasted four days, but the temperature continued to be elevated, rising every evening, sometimes to 105° F. and rarely below 103° F., dropping frequently to normal in the mornings. This continued for 19 days. The face was flushed and slightly swollen, a little like an erysipelas, and she had headache. The glands in the cervical region, the axilla, and the groin were enlarged, the spleen gradually increased in size, and the lower margin could eventually be felt 2 inches below the ribs; the pulse was always over 100, and the presystolic murmur completely disappeared. The child was drowsy but did not appear to be desperately ill at any time. The temperature remained permanently normal after the nineteenth day of pyrexia, and the enlargement of spleen and glands disappeared in the course of the following week. She was discharged two weeks later much improved. It was difficult to detect the presystolic murmur at the time of her discharge.

A blood examination did not show an increase of eosinophils at any time. Most writers have observed eosinophilia, although Marick [4] did not find it to be often present. Two blood cultures taken at the height of the temperature were sterile. Agglutination tests were negative. X ray of chest showed no lesion such as Jones and Jacobs [7] noted in the unusual case which they reported.

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## SUBCUTANEOUS EMPHYSEMA IN A CASE OF BRONCHIAL ASTHMA

By F. CHURCHILL DAVIDSON, M.C., M.B. Edin., D.P.H.

THE patient, a girl 9 years of age, had an eight years' history of bronchial asthma, each attack usually lasting only 24 hours. On March 5th, 1934, at 2 A.M., during an asthmatic attack, she had a spasm of severe coughing during which she experienced a sudden sharp pain in the front of the left upper chest. The pain lasted only a few seconds and she fell asleep again. She slept until 8 A.M., and on waking found her neck was "stiff and painful." On examination it was found that there was extensive subcutaneous infiltration of air into the upper part of chest and back, both shoulders, both arms as far as dorsum of hands, the angles of jaws to clavicles, and both sides of lower half of face. The appearances of the neck resembled infective parotitis (which diagnosis was actually suggested by the child's parent). There was considerable tenderness over the area of swelling, and the typical crepitations of subcutaneous emphysema were easily palpable. The child stated that she felt "cracklings in the ears" when she swallowed. Physical examination of lungs showed those signs associated with asthma—generalised sibili, &c.; there was no evidence of pneumothorax or other pathological lesion. The child felt ill for 24 hours, with slight cyanosis, shortness of breath, a pulse-rate of 120, and a temperature of 100° F. The asthma was relieved quickly by a few doses of Ephedrine syrup, and recovery was complete in a week, the subcutaneous emphysema disappearing slowly and completely. X ray examination could not be arranged but the child was seen by Dr. R. C. Wingfield, Brompton Sanatorium, who confirmed the diagnosis.

From the history of this case it is evident that the air escaped from a rupture of alveoli of left lung into interstitial lung tissue, and from thence via mediastinum to the neck. There was no evidence of any rupture of intercostal muscles.

Camberley, Surrey.

# MEDICAL SOCIETIES

## FELLOWSHIP OF MEDICINE

### DEBATE ON THE TREATMENT OF PEPTIC ULCER

At a special meeting of the Fellowship, held at Manson House, London, on May 30th, with Lord MOYNIHAN in the chair, a discussion took place on the motion "that, in the absence of complications, surgical interference in cases of gastric and duodenal ulcer is unnecessary."

Dr. A. F. HURST, in proposing, said that ten years ago the chairman contended that an ulcer of the stomach large enough to produce a crater demonstrable by X rays could not be cured except by operation. About that time the speaker saw the largest gastric ulcer in his experience, and as a challenge to the prevailing view, he decided to treat it by medical means, warning the patient that the treatment would take a long time. In three months the symptoms had disappeared, and for years afterwards they did not return. To be effective, however, medical treatment must be thorough and prolonged. Duodenal ulcer presented a more difficult problem than gastric ulcer, largely because the duodenum was narrower than the stomach, and slight swelling or spasm sufficed to cause obstruction. Nevertheless he found it very rare for a patient who had had an established ulcer for less than ten years not to get well under medical treatment. An exception to this rule was the familial type of case, in which hæmorrhage began early in life, and the only effective measure seemed to be a large gastrectomy. Some advocated operation in order to prevent hæmorrhage or perforation; but he had never seen perforation in a case in which the patient had had proper medical treatment over a sufficiently long time. It was also said that a poor patient could not afford the time spent on the medical régime. But unfortunately there was no rule which confined major surgery to skilled surgeons, and while in the hands of the latter the operative mortality averaged about 1 per cent., for the whole country it was about 5 per cent.—a very real risk to face.

Mr. A. E. MORTIMER WOOLF said that while he supported the motion as it stood, he did not think the converse was true—namely, that all peptic ulcers, in the absence of complications, should necessarily be treated by the usual medical means. It had not been his experience that perforation did not occur while the patient was having adequate medical treatment. The question of hæmorrhage was very difficult; on the whole, he thought, hæmatemesis in gastric ulcer was rare, and in the presence of such bleeding it was advisable to look for some other condition. Where there was evidence that an ulcer had involved a vessel, the hæmorrhage must be treated in the same way as bleeding anywhere else. The cases which he considered should be operated upon were: those with an anatomical deformity, such as pyloric stenosis, hour-glass stomach, or adhesions; those in which there was a suspicion, or at least a possibility, of carcinoma; and recurring ulcers. In a straightforward case of ulcer without complications he would not advise operation without first trying other methods. He had seen surprisingly good results in cases he had treated by duodenal intubation.

Dr. ROBERT HUTCHISON said that many years ago he had crossed swords with Lord Moynihan and said that many unnecessary operations were performed for duodenal ulcer. His change of view had come about from observing the admirable operative results obtained by Mr. James Sherren at the London Hospital—results not approached by any medical series. He was astounded that Dr. Hurst should say that every case of uncomplicated gastric ulcer which was properly treated medically would heal, and with proper care remain healed. In *Guy's Hospital Reports* in 1928 Dr. L. J. Barford described the end-results in 160 cases of gastric and duodenal ulcer treated at the New Lodge Clinic. For gastric ulcer the results were said to be satisfactory after five years or more in 39 per cent., and fairly satisfactory in 13 per cent., and one-third of these had recurrences. The duodenal ulcer cases were regarded as entirely satisfactory in only 41 per cent., and fairly satisfactory in 28 per cent.; there were 24 per cent. of recurrences, and more than half the latter had had to come to operation. At St. Thomas's Hospital there had been nine cases of dangerous alkalosis in patients undergoing intensive alkaline treatment, and one of them was fatal. Dr. Hutchison contended that patients who had been operated upon could live a freer life than those who had medical treatment, which, with its rigorous restrictions and regulations, meant a condition of invalidism, not health.

Mr. HERBERT PATERSON said he did not approve of duodenal intubation; it was based on unsound principles, and it accomplished nothing which could not be secured by ordinary dieting. He agreed with Dr. Hurst that medical treatment must be adequate, much of the so-called treatment of ulcer at the present day being merely haphazard. Ulcer required months, not merely weeks, to heal. In his own view very great care was needed by patients for at least a year after gastric operations; most of the failures were due to neglect of this precaution. Gastric ulcers could be healed under medical treatment, but he doubted whether the same was true of well-established duodenal ulcers. In three cases he had seen perforation in hospital while the patient was undergoing medical treatment, and some years ago he had followed up 180 cases which had had proper medical treatment, 107 of which (60 per cent.) had relapsed. He was convinced that the risk of operation was less than the risk of hæmorrhage and perforation, and he thought that at least 90 per cent. of cases of duodenal ulcer could be cured by a properly performed gastro-jejunostomy, provided patients were properly advised about their subsequent diet. In the last 20 years he had had 11 medical men patients who preferred medical to surgical treatment, and 3 of them had had perforations, one with a fatal issue. The motion before the meeting was untenable for four reasons: (1) it was contrary to experience that a large ulcer would heal if treated medically; (2) duodenal ulcer seldom or never healed; (3) septic foci, in the appendix for example, must be removed surgically; (4) cases of achlorhydria needed gastrectomy.

Dr. MATHER CORDINER maintained that every gastric ulcer would respond to medical treatment provided there was no question of malignancy. Often malignancy could be detected radiologically and in such cases medical treatment should not of course be attempted.

Dr. ERNEST YOUNG spoke of some cases with very large ulcers which he had treated by duodenal intubation. The longest time required for healing was six weeks.

Sir WILLIAM WHEELER said that the good physician would not delay matters by treating medically a case in which medical treatment was likely to prove

futile. The general public were largely to blame if they went to an indifferent surgeon or physician.

Dr. WALTER CARR believed that sooner or later all, or almost all, cases of gastric, and certainly all cases of duodenal, ulcer relapsed. A second relapse should always mean surgical interference. The only alternative was for the patient to submit to very severe restrictions for the rest of his life; and his own advice was that it was better to face the comparatively small risks of operation.

Mr. L. N. PYRAH said that in Leeds since 1926 there had been an increase in the medical treatment of ulcer, a decrease in the number of cases of chronic ulcer operated upon, and an increase in the number of perforated ulcers. The number of cases of hæmorrhage admitted to the wards seemed also to have increased considerably.

Dr. J. R. BELL (Melbourne) felt that there had never been enough amicable coöperation between physician and surgeon to secure the best possible results for the patient. He did not agree with those who said gastric ulcer responded better to medical treatment than duodenal ulcer; his experience had been otherwise. He had seen many patients suffering from unpleasant after-effects of gastro-enterostomy.

Mr. W. E. TANNER emphasised the importance of searching for a cause of these conditions, and expressed his belief that ulcers of stomach and duodenum had a microbial origin.

Dr. JACQUES SPIRA said he had shown these ulcers to be due to the action of a direct local irritant on the mucous membrane, and acting on these lines had secured uniformly good results.

The openers having briefly replied,

The CHAIRMAN said the point which needed real insistence was the inefficiency of medical treatment as generally carried out in this country. He was himself strongly in favour of medical measures. His figures showed that of five patients consulting him for surgical treatment, three were referred back to the physicians; though not infrequently some of them came back after medical treatment. Ulcers took a long time to heal; it was essential that patients should rest in bed, with restricted diet, and that the treatment should extend over a considerable time, and he thought that following Prof. H. Maclean's paper surgical aid had been less called for, perforations had increased, and deaths also. As for Dr. Hurst's statement that he had never seen a death from hæmorrhage or perforation while a patient was undergoing medical treatment, he could only reply that he had seen so many that he had lost count of them. Medical treatment was in fact more dangerous than surgical treatment. At the same time he rarely liked to operate until he was satisfied that non-operative treatment had been carried out as thoroughly as possible.

The voting showed the following result: for the motion, 70; against it, 73.

## MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES

A MEETING of this society was held in London on May 30th with Dr. DAVID NABARRO, the president, in the chair, when a paper on

### Venereal Disease in Literature

was read by Dr. J. D. ROLLESTON. He pointed out that the value of the allusions made by lay writers in various ages to venereal disease is indicated by the attention given them by numerous medical historians. In spite of statements to the contrary, there is no definite evidence in non-medical literature that syphilis existed in biblical times, classical antiquity, or the Middle Ages. In the sixteenth century the best known lay writers who refer to syphilis are Guicciardini, the historian, Erasmus, and Rabelais. In the Elizabethan age numerous references to syphilis are to be found in Shakespeare and other dramatists of the time. In the eighteenth century the prevalence and severity of syphilis are illustrated in the works of Voltaire, Casanova, Defoe, Fielding, Smollett, Steele, Swift, Gay, and Chesterfield. The belletristic literature of the nineteenth century contains for the first time descriptions of tabes and general paralysis (Heine, Alphonse Daudet, the De Goncourts, Guy de Maupassant, Ibsen, Conan Doyle, and Kipling). The antisyphilitic campaign in the French drama and novel at the beginning of the twentieth century was inspired by Alfred Fournier. Gonorrhœa, of which the first description is in Leviticus, dates from remote antiquity. Owing to its identification with syphilis for about two hundred and fifty years, the terms "clap" and "pox" in non-medical literature are used indiscriminately, the former being sometimes applied to tertiary syphilis and the latter to acute gonorrhœa. Chancroid is probably as old as gonorrhœa and was well known in classical antiquity and the Middle Ages.

A discussion followed in which the PRESIDENT, Sir D'ARCY POWER, Dr. H. J. NORMAN, Dr. PARKES WEBER, and others took part.

# NEW INVENTIONS

## AN IMPROVED CLINICAL THERMOMETER CASE

I HAVE designed a thermometer case which protects the instrument during the vulnerable periods of its career. Until clinical thermometers can be made so as to be absolutely indestructible, we must put up with breakage due to accidental dropping, though quite a number are broken in the thin case usually provided as a container. Moreover, these cases do not sterilise the thermometer. The container here illustrated is a strong metal tube longitudinally fenestrated, and lined with a Pyrex glass tube (the

strongest glass known), the ends of this lining being ground to a watertight fit against washers at each end. The lower end of this tube has a light compression spring-loaded ferrule in which the bulb of the thermometer is held. The screw-cap at the other end presses the thermometer down into the tube and keeps it comfortably housed—in spirit or other antiseptic; a clip, of the fountain-pen type, keeps the case snug in one's pocket. Thus the thermometer is kept safe, sterile, and ready to hand. Owing to atmospheric pressure, when the thermometer has been extracted and the case laid on its side, the fluid does not run out.

The Holborn Surgical Instrument Co., Ltd., of 26, Thavies-inn, London, E.C.1, are the makers.

B. RICHARDSON BILLINGS, M.R.C.S., L.R.C.P. Lond.
Folkestone.

# REVIEWS AND NOTICES OF BOOKS

## Diabetes Mellitus

By I. M. RABINOWITCH, D.Sc., M.D., C.M., F.R.C.P.(C.), Assistant Professor of Medicine and Lecturer in Biochemistry, McGill University; Director, the Department of Metabolism, the Montreal General Hospital. London: Macmillan and Co., Ltd. 1933. Pp. 246. 16s.

Dr. Rabinowitch has written this handbook to explain a simplified method of treating diabetes mellitus, and also to describe the high carbohydrate-low fat caloric diet which he has done much to popularise. The first few chapters give a good account of the different types of diabetes and the methods of diagnosis. The description of the action of insulin and of the various manifestations of hypoglycæmia is exceptionally clear. The advantages of the high carbohydrate-low fat caloric diet are then explained. As the amount of carbohydrate is very large, 250 to 300 g., it is unnecessary to weigh the different carbohydrate foods accurately. Dr. Rabinowitch therefore supplies his patients with wooden and paper models. A piece of wood 3½″ by 3½″ by ½″ represents 1 oz. of bread, and one of 1″ by 1″ by ½″ represents ½ oz. of butter. Similar models represent the various kinds of protein and fruits consumed. Dr. Rabinowitch always attempts to render the urine free from sugar by diet alone. He uses a ladder diet, starting with one day of starvation. The carbohydrate of the diet is rapidly increased, but the fat ration is very small, being only 50 g. Most of the patients in Montreal do not need insulin, but if sugar does not disappear it is always administered. The dose of insulin is assessed where possible by testing for sugar samples of the urine collected every four or five hours. Estimations of the blood-sugar are made in all cases of difficulty. The diet aimed at is C. 275 g., P. 80 g., and F. 45 g.—calories 1800. The patient is warned repeatedly against the danger of excessive quantities of fat; if, however, they are not content with the small amount of fat allowed, the carbohydrate of the diet is reduced and the fat increased.

The results with this treatment are said to be good, but it seems as ill-balanced as did the old diabetic diet of C. 40 g., F. 250 g.; and the advantages of a low fat régime with a moderately high carbohydrate—say 150 g.—and a moderate amount of fat—say 100 g.—must surely be made more clear before it is justifiable to require patients to submit to such a régime. The influence of any acute infection and also of chronic disease, such as gall-bladder infections, are well explained, and the rules laid down for the care of the feet in elderly people are very sound. But curious errors are made in speaking of the acetone bodies. Acetone is described as present in the urine, whereas Folin showed that this substance is not present in freshly passed urine, occurring only as a result of the decomposition of aceto-acetic acid; beta oxybutyric acid is described as diacetic acid, which is the correct name for aceto-acetic acid. The nitro-prusside test, which is actually more than ten times as sensitive for diacetic acid as it is for acetone, is recommended as a test for acetone, although it is said to be also a test for diacetic acid. Ferric chloride, described here as a test for diacetic acid, is not a sensitive test, and is often negative when the nitro-prusside test is positive, as Dr. Rabinowitch himself points out. Rothera's modification of the nitro-prusside test is not described.

The account of the sugar-tolerance test and the varieties of curves met with is valuable. The incidence of renal glycosuria seems much lower in Canada than in this country.

The book is of interest in that it gives a clear account of an unusual method of treatment. Some years will be needed, however, before it is possible to say whether the diet recommended has any substantial advantages over the more palatable one now in general use.

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## Röntgentherapie in Tabellenform

By Dr. EMMERICH MARKOVITS (from the Roentgen Laboratory of the Krankenhaus Stadt Armenheim in Budapest). Leipzig: Georg Thieme. 1934. Pp. 153. M.10.80.

THE tables compiled by Dr. Markovits form an excellent guide to the methods of treatment by deep X ray therapy used in his clinic. The unit of dosage adopted is the biological "skin erythema dose," which the author regards as preferable to the international r unit which he finds in practice to vary greatly with different factors. For malignant disease the "Coutard-Pfahler" method is recommended. However effective this may be, it seems unfortunate that the names of two workers whose ideas are based on different conceptions of the biological response to radiation should be attached to any scheme of treatment.

The remarks on methods and dosage are introductory to a series of tables which include every disease which may be treated by X rays whether deep or superficial. The signs and symptoms, the indications for treatment, the benefits to be anticipated are set out with the technique advised, the possible complications, and the contra-indications. Some of the disorders included would not in this country be subjected to irradiation, but this is more commonly used for chronic infections in continental clinics than it is here, and good results are said to be obtained. The claims made by Dr. Markovits are not extravagant. When discussing the indications for irradiation in several forms of malignant disease he lays it down clearly that surgery is the method of choice, irradiation being considered only as a prophylactic treatment after operation or for inoperable cases. In respect of many conditions, notably ovarian tumours, it is stated that there are no contra-indications to treatment by X rays. Actually the general contra-indications, such as advanced cachexia or acute infection, have previously been noted, but it is misleading to ignore these entirely when specific diseases are under consideration.

On the whole this book represents a successful attempt to compress the fruits of much experience into a form which will allow others to benefit from it. The book ends with some useful plates and figures.

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## Dermatology and Syphilology

Practical Medicine Series. 1933. By FRED WISE, M.D., and MARION B. SULZBERGER, M.D. Chicago: The Year Book Publishers. Pp. 458. $2.25.

THIS publication contains abstracts from the syphilo-dermatological literature of all countries during 1933. It is essentially a book for the specialist, although the introductory article by the editors on the treatment of acne vulgaris might well lure the general practitioner into the fold of the annual subscriber. There is ample scope for such a volume, for nobody, however voracious a reader, can hope to keep abreast of the literature and memorise even the

best of the communications that annually advance these subjects. Some 200 articles and papers are abstracted, and a few lines of editorial comment and criticism are appended to some of them. The process is one which if further expanded would rob the literature of much of its terrors, and absolve the research worker from some tedious preliminary work.

The previous volume—1932—was the first to separate the subject of urology from this series, and the policy should make this issue decidedly more attractive to dermatologists. The table of contents has been enlarged by the addition of the article on acne mentioned above, a section on physical therapy, and another containing some interesting "experimental and investigative studies" among which German authors are overwhelmingly represented, Great Britain by only one, and France by none at all. A further addition is a supplementary bibliography with full references of some 180 contributions, American, German, Norwegian, and Italian, not considered quite worthy of abstraction for the purposes of this volume. French and British authors are again in the minority.

There can be no doubt at all that the idea of grouping the best publications and abstracting them annually in this way has much to commend it, not only because of the facilities afforded to busy workers who want to keep up to date, but also to save deserving authors from relative oblivion.

## Combined Text-book of Obstetrics and Gynæcology

Second edition, revised, rewritten, and enlarged. By J. M. MUNRO KERR, M.D., F.R.F.P. & S. Glasg., J. HAIG FERGUSON, M.D., F.R.C.S. Edin., JAMES YOUNG, D.S.O., M.D., F.R.C.S. Edin., and JAMES HENDRY, M.B.E., B.Sc., M.B., F.R.C.P. & S. Glasg. Edinburgh: E. and S. Livingstone. 1933. Pp. 1100. 35*s*.

THE greater part of this text-book is devoted to obstetrics, of which a well-balanced account is given, in sufficient detail for the student. The second edition has been thoroughly revised and brought up to date. The chapters on toxæmias of pregnancy and puerperal sepsis are excellent, and an interesting final section on the causes and factors influencing puerperal mortality is included. Intercurrent diseases are discussed fully, and Prof. Charles McNeil contributes a useful chapter on "The Infant in the First Month."

Undue prominence is given to Schultze's and Byrd's methods of artificial respiration in the newborn; the illustrations of the first might have been omitted, since the authors themselves state that it is not now favoured, and recommend less violent measures. We regret to see the illustration of management of the perineum by the "British method" appear once more. The control of the head with the left hand passed from above between the mother's thighs would involve extreme discomfort for the obstetrician in prolonged delivery, and danger of sepsis for the patient. The short paragraph on septic abortion, a subject of great and increasing importance, is inadequate and gives no guidance in treatment. Otherwise, the obstetric section is well written and highly informative.

Gynæcology is treated more shortly. We have detected no omissions; the theories about the production of endometrioma are discussed, and rare conditions such as granulosa-cell tumours and Krukenberg tumours are described and figured. Mention might have been made of the importance of the Aschheim-Zondek reaction in the diagnosis of chorion-epithelioma. The relatively small space given to gynæcology necessarily curtails the amount of detail in the book.

Descriptions are given of all the important obstetric and gynæcological operations, with a final short chapter on radiology by Dr. J. Duncan White. The work is well illustrated by some 500 drawings and photographs.

## Obstetrícia Operatória

By RAUL BRIQUET, Professor of Clinical Obstetrics in the Medical Faculty of São Paulo. São Paulo: Companhia Editora Nacional. Pp. 540.

THIS book, intended for students and practitioners of midwifery, is clearly written. The marginal headings, and the system of arranging the different operations in numbered steps, facilitates rapid reference. The illustrations, many of which are borrowed from well-known text-books, are good. The chapters on maternal and fœtal traumata, and on the indications and contra-indications to operation, are particularly useful. Certain omissions are noticeable—e.g., no mention is made of axis-traction forceps or of glycerin drainage. The chapter on anæsthesia contains 38 pages devoted to spinal anæsthesia, and only two on inhalation methods, under which heading only chloroform and ether are discussed; and gas-and-oxygen is not mentioned. In the description of the technique of blood transfusion no account is given of the preliminary grouping of the bloods, and the necessity for this is not explained. The book is marred by inaccuracies, of which a proportion only is included in a list of errata. Foreign words, in particular, are often misspelt. These errors render the book troublesome to read and diminish its value.

## Practitioner's Library of Medicine and Surgery

Vol. VI. *Obstetrics and Gynæcology*. Associate Editor: LUTHER K. MUSSELMAN, B.S., Ph.D., M.D., Associate Clinical Professor of Obstetrics and Gynæcology, Yale University School of Medicine. London: D. Appleton-Century Company. 1934. Pp. 900. 50*s*.

THIS volume is the outcome of the collaboration of 14 teachers who have each written a monograph on one aspect of midwifery or gynæcology: 560 pages are devoted to midwifery, 278 to gynæcology, and 58 to the index. The preface states that the book is intended for the use of the man in general practice, and this doubtless accounts for the fairly extensive clinical review of obstetric symptomatology and treatment, and for the compression of the gynæcological matter into small space.

The work appears to reflect clearly the present-day practice of midwifery and gynæcology in the United States of America. On the whole the practice recommended is that in common use in this country, but in a few places the teaching would be unacceptable here. Under the heading of toxæmia of pregnancy Dr. Musselman gives a good clinical picture of the various manifestations of this condition. He reviews the usual methods of treatment of eclampsia and pre-eclampsia, and points out the good results of expectant treatment as against the poor results of accouchement forcé. At the conclusion he recommends the practitioner always to adopt expectant treatment as giving the best results for both mother and baby, while admitting that in a good hospital

a specialist will get excellent results from emptying the uterus immediately after the first eclamptic fit. Under the heading of pathological pregnancy are grouped many complicating conditions. Here we notice a certain inclination to advise the woman suffering from defects to put up with them rather than to seek treatment during pregnancy. For example, in gonorrhœal infection of the cervix local treatment is not advised, and even if the condition is accompanied by cervical erosion or warts of the vulva the main emphasis seems to be laid on the instillation of silver nitrate drops into the infant's eyes after birth to avoid the consequences of neglect of treatment of the mother. Each section is supplied with full references, and a good subject index is supplied.

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### 1. Adam's Ancestors

By L. S. B. LEAKEY, M.A., Ph.D. London: Methuen and Co., Ltd. 1934. Pp. 244. 7*s.* 6*d.*

### 2. This Progress: The Tragedy of Evolution

By BERNARD ACWORTH. London: Rich and Cowan. 1934. Pp. 334. 7*s.* 6*d.*

1. Dr. Leakey became famous two or three years ago by his discovery in Tanganyika of the remains of a very primeval man fairly similar to modern *Homo sapiens* and probably in his direct line of descent. In this book he gives a clear and readable discussion of man's immediate ancestry and of the various kinds of men—e.g., *Palæoanthropus neanderthalensis*—which have disappeared. Our knowledge of them comes as much from the remains of their cultures as from their own bones, and a large part of the book is taken up with the description and classification of their imperishable stone implements. Modern research has gone a long way since we knew of nothing but palæoliths and neoliths, and Dr. Leakey's functional tests of these old tools are particularly impressive; he tells us, for instance, that in Africa he skinned and cut up a gazelle in 20 minutes with a tool about 25,000 years old and less than 2 inches long. He also describes from his own experiments how the various implements may be made. It is a good book and cheap, and it should be widely read.

2. Mr. Acworth knows so little of evolution that he regards it as inconsistent with Christianity, and so little of Christianity that he finds it irreconcilable with evolution. In this schoolboy dilemma he, wisely enough perhaps, chooses Christianity, and says that "the theory of evolution is a faith founded in atheism, leading its adherents to nihilism" and much more of the same sort.

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### Diagnostics Urgents—Abdomen

Second edition. By H. MONDOR, Professeur agrégé à la Faculté de Paris; Chirurgien de l'Hôpital Bichat. Paris: Masson et Cie. 1933. 2 vols. Pp. 1064. Fr.125.

THIS treatise is concerned solely with acute abdominal diseases of such a nature that, if surgery be refused, the patients die in a few hours or days. Surgeons will find it of absorbing interest. Every conceivable emergency is considered fully and very clear accounts are given of signs and symptoms. The author's method is to give a general description and then to drive home the lessons he wants to instil by the clinical notes of actual cases. Not all of them are personal ones; several are from classical sources. Prof. Mondor takes no narrow view of his subject. He has searched widely in the literature of this branch of surgery and gives authority for all his statements.

The general make-up of the book and the illustrations reach a high standard. There is perhaps a little unnecessary reiteration, but this at least serves to emphasise the truth of the teaching that the author wishes to drive home. The book represents a store of knowledge of the syndromes of acute surgical abdominal disease.

# EUGENICS IN PRACTICE

*A Series of Essays suggested by the Report of the Brock Committee*

## V.—SEGREGATION OR STERILISATION?

THE reduction of those physical and mental infirmities which are commonly regarded as hereditary can be viewed from different angles by the biologist and the administrator. To the biologist, the problem presents itself in panoramic simplicity as a racial problem. The national birth-rate, he observes, is falling and we are within measurable distance of reaching a stationary or even a declining population. He notes the phenomenon of the differential birth-rate and the fact that the poorest and socially most submerged fraction of the population has the highest fertility and will therefore contribute to the next generation a fraction larger than that which it now constitutes. To the biologist, sterilisation commends itself as a simple, logical, medically feasible, and humanitarian measure whose racial effects can be made to resemble those which, in the past, were more brutally achieved by natural selection. The measure appears to him no less applicable to those mental defectives who owe their infirmity to heredity than to other victims of morbid inheritance.

The administrator, however, sees the problem from a very different angle. Less concerned with biological than with social considerations, he is responsible for the care and protection of individual mental defectives. He is keenly aware that the institutional provision at present available for these is, in many areas, lamentably inadequate. He recognises that the approved sterilising operations leave the defective's antisocial proclivities wholly unchanged and that if a defective stole, committed sexual offences, or made a nuisance of himself before sterilisation, he would continue to do so afterwards. Improved ascertainment and an amplifying of existing institutional accommodation are for him the first requirements to be satisfied. What compromise, if any, can be reached between these two views?

### SEGREGATION HAS NEVER BEEN PROPERLY TRIED

The facts of the matter are as follows: according to the annual report of the Board of Control for 1932, some 35,000 mental defectives are in institutions under the Mental Deficiency Acts. The total number of mental defectives in England and Wales has been estimated by the Wood Committee as 300,000. This committee has further recommended that institutional provision be made for 100,000, or one-third of this total. The committee further advocated what they termed a "new conception" of the function of the institution and the colony for mental defectives. These should no longer be regarded as permanent residences for mental defectives but rather as training

schools, wherein the most would be made of their limited capacities and aptitudes with a view to equipping them to live useful lives under supervision in the general community. The institution, according to a simile employed by the Wood Committee, should be regarded, not as a stagnant pool, but as a flowing lake, through which should pass a stream of defectives who would be stabilised, trained, and subsequently placed in the general community. Like sterilisation, this conception was first put into practice in America, particularly in the work of Fernald to whom we owe the conception of the institution as a socialising force.

That the principle of sterilisation can be usefully adapted to this view was recognised as early as 1929 in the Annual Report for 1928 of the Board of Control which contains the following passage:

> "Roughly speaking, out of 300,000 mental defectives in England and Wales, one-third will require institutional provision and two-thirds some form of community care, that is, care outside an institution. It is in the case of the latter that the risk of procreation arises and the case for sterilisation, if such a case exists at all, is strongest."

This view has been adopted by the Brock Committee which has recommended the creation of legal facilities for the voluntary sterilisation, subject to appropriate safeguards, of certain mental defectives. The measure, however, is clearly limited to those defectives who, apart from the risk of their procreation, are fitted for life in the general community. That is to say, it is wholly unsuited to those mental defectives who have antisocial tendencies which could not be controlled under the conditions of supervision or guardianship which have been specified in the Mental Deficiency Act.

### SAFEGUARDS

There is then no antithesis between segregation and sterilisation. Each is necessarily incomplete and ineffective without the other. Segregation alone has never been applied to the extent of making it eugenically effective, nor could it be so applied without such expense as even an enlightened public opinion might hesitate to incur. But sterilisation would also fail of its purpose unless combined with a far larger and more intelligent use of segregation than is at present the case. As safeguards against abuses and misuses the Brock Committee suggest that an application for sterilisation should be supported by two medical practitioners, one of whom should, if possible, be the patient's family doctor and the other a practitioner on a list approved by the Minister of Health. In all cases in which the patient is capable of giving consent he should sign a declaration of willingness to be sterilised, and one of the two medical recommendations should include a statement that the effect of the operation has been explained to the patient and that, in the medical practitioner's opinion, he is capable of understanding it. If the practitioner is not satisfied that the patient is competent to give a reasonable consent, the full consent and understanding of the parent or guardian should be obtained, and if the applicant is married, he or she should be required to notify the spouse of the application.

It would be undesirable as a general principle to make discharge from an institution conditional upon sterilisation; for apart from being a form of "veiled coercion," this would make it possible for the parent or guardian, by refusing consent to sterilisation, to keep a defective permanently in an institution.

Provided then that sterilisation is used with discrimination and is not forced upon the defective or his relatives against their inclinations and scruples, it can clearly be used as an auxiliary to segregation in such a way as not to interfere with the fulfilment of the recommendations of the Wood Committee relating to the creation of increased facilities for segregation.

### THE QUESTION OF COMPULSION

"What is the use," it is sometimes asked, "of limiting proposals for eugenic sterilisation to voluntary measures? These will never be adopted by the very people whose fertility we are most anxious to restrict. Such are incapable of using contraception, still less sexual abstinence. The only way to deal with real slum types in any big town is to sterilise them willy-nilly." This argument has been increasingly heard since the publication of the Brock report. Though the German Sterilisation Act has only been in force since the beginning of the present year some information about its workings is already available. Nine conditions are specified which justify voluntary or compulsory sterilisation. These include schizophrenia and manic-depressive insanity, disorders which, along with seven other morbid conditions, are notifiable much as are certain infectious diseases in this country. A person in whom a diagnosis of any of these nine conditions has been made becomes a potential candidate for voluntary or compulsory sterilisation.

But the diagnosis of mental disorders is not as simple and straightforward a business as the diagnosis of most common physical ailments; both the standard and the terminology employed by psychiatrists differ in different countries and even in the same country. Since the passing of the Sterilisation Act it has been noticed that German doctors hesitate to diagnose schizophrenia and manic-depressive insanity, preferring to use other and less compromising diagnostic labels. People are beginning to be afraid of entering public institutions for the treatment of mental disorder, wherein they may be compulsorily sterilised before discharge; and they are inclined to conceal important elements of their pedigrees which might substantiate these diagnoses. If this goes on it will put an end to any open inquiry into the genetics of mental disorder which, above all things, depends on the submission of accurate pedigrees. More important than all this in the life of the community is the fact that the use of sterilisation as a compulsory measure will inevitably cause a stigma to be attached to the operation in exactly the way that would happen if it were used as a weapon for punishing crime. An individual would have to exhibit very undesirable characteristics to be compulsorily sterilised; and if such a measure became law people would hesitate before coming forward voluntarily for sterilisation, lest they be tarred with the same brush. The German propaganda is distinguishing with great care between the eugenic and the punitive.

It has moreover been found, in those States in America where voluntary and compulsory clauses exist, that superintendents of institutions will not incur the unpleasantness of applying compulsion unless they are supported by public feeling. But where a favourable public feeling exists, people will avail themselves of sterilisation voluntarily. Where the measure lacks public support no one gets sterilised, even if compulsory clauses are in force; where public support for sterilisation is forthcoming compulsory clauses are unnecessary. It can therefore be said that though occasional cases can undoubtedly be found to which compulsion appears applicable, the advantages of formulating coercive clauses to meet them are entirely outweighed by the accompanying disadvantages.

# THE LANCET

*LONDON: SATURDAY, JUNE 9, 1934*


## SCHOOL EPIDEMICS

IT is not easy for the school medical officer to handle the problem of infectious disease in a way that will please everyone. Caution in his methods of isolation leads the parent to complain that his money and the child's time are being wasted; laxity lays him open to censure. The old-fashioned parent seemed content to look upon the public school as a place where the character and physique of his children were hardened and prepared for the larger world. The weakest went to the wall and the survivors emerged morally and physically "salted." The parent of to-day expects a large measure of individual care, both as regards mind and body, to be given, and unflagging efforts are made by school-masters, medical officers, and others to provide this care. Nor is the effort restricted to individual schools and their officers. The modern school doctor exchanges frequent notes with his colleagues elsewhere on matters of school hygiene. For some years past the Medical Research Council have had a special committee for the investigation of school epidemics; 30 large public schools coöperate in keeping this committee continuously informed of what is happening in the schools. Already valuable information has been acquired. Special laboratory investigations have been carried out using the material provided by those schools. Among the more important results have been those submitted by J. A. GLOVER and F. GRIFFITH on streptococcal infections in schools. Much light has been shed on the spread of conditions due to infection with hæmolytic streptococci; the cumulative effect of nasopharyngeal epidemics is recognised, and that an epidemic of colds may lead to an outbreak of sore-throat, which in its turn may give rise to otitis or mastoiditis. An epidemic of scarlet fever may be concealed in such apparently modest manifestations.

There is instruction to be gained from contrasting girls' schools with boys'. As compared with boys, girls have had less than half the incidence of otitis media and pneumonia, and only one-eighth the incidence of sinusitis. This may be ascribed in part to the greater care and supervision which girls receive, but is probably more closely connected with the better sleeping accommodation at the girls' schools. Most modern observers have emphasised the importance of dormitories as breeding grounds for epidemics. There is little doubt that better dormitory conditions and less overcrowding would improve the hygienic reputation of some of our public schools. In this direction, at least, the schools themselves have an ample field for effort, and it is but fair to say that most of them are doing as much as their finances allow.

One of the outstanding things in modern school hygiene has been the success of the preparatory schools in achieving perfect health conditions. The public schools might well complain that the efforts and precautions of many of the preparatory schools have been too successful. Boys and girls go on to the big schools in a state of epidemiological innocence and with little preparation for guerilla warfare with microbial infection. The public schools have thus to bear the brunt not only of epidemics of their own age-group but of others which, if they must be faced, might well have been faced earlier. It is not uncommon for a boy or girl to catch measles, whooping-cough, and scarlet fever in addition to minor infectious complaints during the three or four years at public school, and even if the scholar passes through these without giving personal cause for anxiety the parent may become restive at the loss of school time due to the interference in routine which must accompany epidemics. Artificial immunisation has little to offer. Its modern triumph is against diphtheria, a disease rarely met with in better class schools. The public hears vaguely that scarlet fever and measles can now be prevented or aborted, and though this is true it would be well-nigh impossible to apply the new methods to school life. The only solution of general application is the one attempted in all well-managed schools—to keep the individual boy or girl in the best possible state of health and to make every effort to prevent threatened epidemics from gathering headway. Infection being accepted as inevitable, the child encounters it in the best possible position to overcome it with his own defences. We hope it may not be taken as a counsel of despair if we suggest that until the study of infection has reached a more advanced stage it would be well for the parent (even if he is a doctor) to look upon the public schools, with his grandfather's eyes, as a place where a boy can learn to make his first trials against the struggles and hardships of life, not forgetting that this applies as much to the attacks of microbes as to the chastenings of his fellows.

## PERIPHERAL VASCULAR DISEASE

THE relief which surgery can afford in certain disorders of the peripheral blood-vessels has aroused a growing interest in the selection of cases suitable for operation, and consequently in the pathology of arterial obstruction. The study of patients showing the various manifestations of peripheral vascular disease has exposed our lack of knowledge of the processes which bring about changes in colour, temperature, and sensation in the affected extremities, and the need to develop methods of investigation which besides giving reliable information with regard to the state of the arteries, arterioles, and capillaries, will also indicate the value of various forms of treatment. Steps in this direction are being made in centres of clinical research in this country and in the United States, and workers in the vascular disease clinics established respectively in Chicago and in Cincinnati have recently described their routine methods of examining patients.

G. DE TAKATS and W. D. MACKENZIE, of Chicago, lay particular stress [1] on the value of the tests in determining the lowest level at which amputation may be performed with a good prospect of sound healing, but the tabulated notes of cases of organic and spasmodic vascular disorders indicate how often amputation may be avoided by carefully planned physiotherapy, exercises and other measures, such as protein shock, designed to encourage the peripheral circulation. In every case a note is made of the volume of the pulse in the main vessels of all four extremities; the surface temperature is registered at several points, and the elasticity of the main vessels is tested by means of the Pachon oscillometer. These tests provide information about the condition of the arteries; the smaller vessels being examined by observing the variations in the colour of the skin as the result of changes in posture, and also by the cutaneous reaction to the injection of a small quantity of histamine acid phosphate. X ray examinations for calcareous degeneration and also after injection of iopax, skiodan, or thorotrast are made in every case, and among the investigations to be carried out only under special circumstances is mentioned excision of a short portion of one of the smaller arteries for histological examination. This may seem a drastic procedure in a limb already suffering from the effects of arterial damage, but it is essential that the details of the morbid processes in the vessel walls should be ascertained in order to correlate the clinical findings with the true pathology, and there is evidence that excision of a portion of a diseased artery may not be as harmful as it sounds, and may in fact be beneficial.

The keynote of the communication by M. R. REID,[2] of Cincinnati, is the conservative treatment of the complications of vascular disease, and especially the alternatives to amputation for gangrene. From an intensive study of his clinical material he concludes that arteries may become occluded by a gradual process without any noticeable change in the tissues supplied by them, but that when a limb in such a critical condition is exposed to cold, is attacked by infection, or has another of its arteries occluded *suddenly* by embolism or thrombosis, gangrene is extremely likely to supervene. He believes that the difference between gradual and sudden occlusion of the arteries is to be explained by the element of vasospasm accompanying sudden blockage, and he devotes the greater part of his paper to the consideration of various measures which may be adopted to tide the patient over the critical period immediately after the occurrence of the block and until the supply of blood can be readjusted to the demands of the tissues for it. In addition to good nursing, care of the skin, application of warmth, attention to the posture of the limb, and administration of large quantities of fluid, REID advocates a new piece of apparatus designed with the same object, that of improving the peripheral circulation in sclerotic arteries so as to avoid amputation. It consists of a chamber shaped like a large boot which surrounds the limb, and is connected to a motor-driven pump capable of producing alternating positive and negative pressures within it. The leg is treated in a slightly elevated position, and the machine is set so as to produce a negative pressure of 80 mm. Hg alternating with a positive pressure of 20 mm. Hg, the duration of a complete cycle being about 30 seconds, and a single treatment lasting on the average about 20 minutes. The machine is sold under the name of the Pavaex Treatment Unit, Pavaex being a portmanteau word for passive vascular exercises. The value of this apparatus is established by the results obtained in 69 patients, all with advanced arterial disease, and many showing the premonitory signs of gangrene or even fully developed gangrene of one or more digits. The most noticeable effect, which occurred in every patient, was that the surface temperature of the limb rose and remained up for several hours after the treatment. When treatments were repeated at frequent intervals it was possible to maintain this rise of temperature indefinitely, and as the effect is due presumably to increase of collateral circulation, the relief of pain and the improvement in the nutrition of the limb which accompany it are readily accounted for.

The reference to spasm in the distal vessels as a result of embolism or thrombosis of an artery recalls the work of R. LERICHE and P. STRICKER,[3] who have recorded great improvement in the peripheral circulation following excision of the occluded segment of the artery. They explain this remarkable observation by supposing that the inflammatory changes in the vessel wall at the site of occlusion stimulate the sympathetic nerves in the tunica adventitia, thus causing peripheral vasoconstriction. This explanation revives the hardy controversy about the justification for peri-arterial sympathectomy, and though anatomists still have nothing to say in its favour there are many surgeons, prominent among them being Prof. ARCHIBALD YOUNG, whose confidence in the operation remains unshaken. Prof. YOUNG, in an account [4] of his own experience of peri-arterial sympathectomy in the treatment of a large number of circulatory disorders, concludes that its value has been proved clinically, and that "it is for the anatomist and the physiologist to explain the results on whatever basis they choose." Prof. YOUNG supplies also an interesting account of the manner in which our knowledge of the nervous control of the blood-vessels has gradually been built up, and refers to a little-known series of experiments carried out by LISTER in 1857 which can be recognised as a natural prelude to the work of GASKELL, LANGLEY, and BAYLISS. The interest of surgeons in the problems of vascular disease is more intense now than it has ever been before, and there is reason to hope that, given clinical methods of investigation accurate enough to indicate the value of various methods of treatment, surgery may again prove a powerful instrument of research.

[1] De Takats, G., and Mackenzie, W. D.: Surg., Gyn., and Obst., 1934, lviii., 655.
[2] Reid, M. R.: Amer. Jour. Surg., 1934, xxiv., 12.
[3] L'arteriectomie dans les arterites obliterantes, Paris, 1933.
[4] Glasgow Med. Jour., 1931, cxv., 273.

## PROGRESS IN PSYCHIATRY

A REVIEW of any one disorder tends to incorporate much of the history of similar conditions, and Dr. A. J. LEWIS, in his recent review of melancholia [1] accuses himself of writing something like a history of psychiatry. By such a fault, if it be one, psychiatrists are so much the richer. It would be impossible, however, not to have made this welcome mistake seeing that the affective disorders have only been clearly differentiated from the schizophrenic psychoses within the last hundred years. Vogel (1724–74) classified *morbi mentis* into six: mania, melancholia, fatuitas stupiditas amentia, and oblivio. In 1849 in his Croonian lectures John Conolly of Hanwell, the champion of "no restraint," could still describe mania and melancholia as the two chief types of mental disorder; but he saw that stupor and apathy, of a type now regarded as schizophrenic, were definitely of another order. To-day the discussion whether psychotic depressions and neurotic depressions can be separated still continues, though Dr. Lewis himself shows that he believes attempts at rigid segregation may defeat scientific accuracy.

The cleavage between those who have attempted to explain or classify mental disease, and those who have aimed at giving accurate clinical descriptions, is clearly seen in Dr. Lewis's review. The German school are typical of the former, Esquirol pre-eminent in the latter; while Maudsley occupies a distinguished position midway. There have been endless theories, from those of Hippocrates, who divided mental disorders into four (mania, melancholia, paranoia, and phrenitis), and Galen, with his emphasis on a superfluity of black bile in melancholia, down to the present day. Riverius, of Montpellier, in the sixteenth century insisted on a proximate cause, a poison generated in the body, which can be taken up and developed best in the "atrabiliar constitution," and thus preceded those who at the present time seek in the disorder for some fundamental biochemical abnormality. John Brown in the eighteenth century, viewing insanity as a disease not of a single part but of the whole body, was in a sense the father of modern theories. Paracelsus (1658) and van Helmont (1707) suggested that melancholia springs from anger and fright and that these arise in some way from the stomach—a view which recalls Stransky's unconfirmed theory of 20 years ago that the vegetative nervous system and the endocrines are largely responsible for the condition. English physicians before Pinel were accused by him of confusing the issue by their theories—a taunt which can hardly be levelled at the German school led by Griesinger. This school produced Kahlbaum, who showed how the morbid affect could account for all the mental signs in melancholia but not for those in primary dementia (dementia præcox), and Kraepelin, who built the theories of others into the most stable elements of modern classifications. The French school is notable for Pinel, who was the first pleader for more humane treatment of the insane; Esquirol, who combined interesting theories with a genius for clinical observation; Falret, who first described *folie circulaire* in 1855, and whose influence on Kraepelin, Dr. Lewis says, "may be safely assumed"; and Morel and his successors, who first drew attention to constitutional and inherited factors, and must thus be placed, chronologically, before Kretschmer. Finally, tribute is paid to Adolf Meyer, whose emphasis upon the psycho-biological individual reactions has influenced psychiatrists' conceptions profoundly. Bonhoeffer's description of exogenous types of reaction belongs to the present century, as do the theories of the psycho-analytical school.

Dr. Lewis reminds us that his exhaustive and illuminating survey hardly deals with therapy. The history of mental disorder has been marked by the efforts of the exorcisers and believers in witch-magic—a fact which was only poorly concealed by our ancestors in the medical art. Thus to quote again regarding Brown: his theories led him to attempt to excite the opposite emotions in his patients, and the depressed melancholics were subjected to the cruellest alarms. Avicenna, in the eleventh century, was the father of the whirling chair. Electricity was used in the eighteenth century, and warm baths for mania and cold baths for melancholia were advised at the same time. It is interesting to note that Pargeter, in the same century, recommended snuff, on the assumption that it aids the removal of lymph from the upper respiratory tract, and that the sneezing stimulates the nervous system. Dr. Lewis omits any discussion of the "humane" aspects of treatment, but these have been fully and frequently considered elsewhere.

[1] Jour. Ment. Sci., 1934, lxxx., 1.

## THE BIRTHDAY HONOURS

ON page 1256 will be found the names of the members of the medical profession who have received honours on the occasion of the King's birthday, but in addition to those who have a place on the Medical Register there are others in the list whose work has been discharged either in close alliance with medicine or in fields where their activities make for the promotion of medicine. Everyone will recognise among these as one deserving of public honour Miss A. F. Lloyd Still, whose services alike as president of the International Council of Nurses and matron of St. Thomas's Hospital have been of high importance. Miss Lloyd Still becomes D.B.E. Among the new knight bachelors will be found Captain Ian Fraser, M.P., chairman of the Executive Council of St. Dunstan's, whose zealous activity on behalf of the blind commands admiration. Miss Nancy Stephen, in connexion with the Red Cross Society, has laboured for blinded ex-soldiers in the Commonwealth of Australia and receives the O.B.E., and the same distinction falls to Miss Ethel Rose Collins, R.R.C., principal matron, Queen Alexandra's Imperial Military Nursing Service. The M.B.E. has been awarded to Mr. Norman Casey, superintendent of prisons in Fiji, and Mr. Alfred Nicholls, superintendent of police and prisons at St. Helena. Mrs. Ann Maria Greenwood, matron at the British Military Families Hospital, Hyderabad, receives the M.B.E., as also do Miss Sarah Jane Lambert, R.R.C., county nursing superintendent and inspector of midwives, Isle of Wight, and Miss Mabel Elsie Wolff, inspector of midwives, Sudan. The Kaisar-i-Hind Gold Medal has been awarded to Miss Lena Benjamin, superintendent of the American Baptist Mission Hospital, Madras; and to Mrs. Jeenabai Duggan, of Bombay. To all the medical men and women in the honours list, and equally to those whose coöperation in their work has been signalled out, we offer congratulations.

# ANNOTATIONS

## THE SHENLEY MENTAL HOSPITAL

In opening this hospital last week, H.M. the King spoke of recent advance in ideas governing the treatment of mental disease and of the opportunity offered by the Mental Treatment Act, 1930. As far as this country is concerned the Shenley Hospital represents a new development; treatment of the poorer classes in Middlesex is now to be undertaken in surroundings and under conditions which have previously only been open to the middle and upper classes. At all mental hospitals of recent years the villa system has been adopted when new building was required. These plans have been fostered and encouraged by the Board of Control, under the chairmanship of Mr. L. G. Brock. But the villas have always been built in proximity to the older buildings and have shared their drawbacks. Too often patients in new villas have had to be transferred to wards in older wings with airing-courts surrounded by brick walls. Shenley will house not fewer patients than the average county mental hospital; ultimately there is to be accommodation for 2000 without overcrowding, all living in communities of not more than 45 patients per unit. The account which we gave in our last issue (p. 1198) of the actual buildings showed how every new and up-to-date principle in psychiatry has been embodied in the hospital. Every member of the profession, whether specially interested in psychological medicine or not, will watch with keen interest the results of the Shenley Hospital; for the principles therein realised spring from the recognition that the mental patient is worthy of as close study, sympathy, and encouragement as his neighbour whose affliction is only physical. In time other counties will be enlightened enough to build hospitals after this new pattern.

## THE NEW GERMAN VACCINATION LAW

THE Home Secretary of the Reich has promised a revision of the Vaccination Law in force which dates from April 8th, 1874, and as it is taking him longer than he expected to draw up, and time presses, he has issued [1] instructions to public vaccinators how to carry on in the meantime. Under the 1874 law primary vaccination was compulsory within the first year of life, apart from medical exemption, and a revaccination in the twelfth year. The instruction was to make four shallow cuts not more than 1 cm. long and at least 2 cm. apart. The prescribed routine technique is now to make two shallow cuts only 3 mm. long and at least 2 cm. apart on the right upper arm, the left upper arm being reserved for revaccination. Other sites are permissible if preference is expressed for them. Vaccination is commonly to be carried out at regular sessions specially arranged for the purpose, but the public vaccinator must vaccinate at other times and places should parents or guardians insist upon it. He must at all times be accessible to parents or guardians who observe anything unusual after the vaccination. He is given a good deal of discretion as to postponement for one or two years. In every case inquiry has to be made as to the existence of infectious illness or skin eruptions of any kind at the vaccinee's home and whether the vaccinee is subject to any skin complaint or has any liability to convulsions. Special emphasis is laid on the importance of postponement should there have been inflammatory disease of the central nervous system in the household or any story of mishap after a previous vaccination in the family, whether well authenticated or not. Finally, emphasis is laid on the duty of public vaccinators to instruct the population in their neighbourhood about the nature and purpose of vaccination by every means within their power.

[1] Münch. med. Woch., May 4th, p. 700.

## THE SUCCESS OF SANATORIUM TREATMENT

AT first sight it would seem to be a simple enough task to measure the degree of success which attends sanatorium treatment. In reality, as Dr. A. S. MacNalty has pointed out,[1] it is extremely difficult, for physicians have different standards of selection and classification of patients, the after-histories of patients have not been collected for a sufficient number of years, and the data at present available are very scanty. Still more difficult is it to determine the influence that the development of sanatorium methods has had not only upon the lives of the patients but on the general mortality for which tuberculosis is responsible. It is probable that numerous factors have contributed to the decline in the tuberculosis death-rate observed for many years. To isolate the part played by one possible influence is a precarious task. Using the vital statistics of the provinces of Canada Dr. Madge Macklin has recently made an attempt to answer the question.[2] For each of the seven provinces she has determined the tuberculosis death-rates in 1921–29, by age and sex, and has placed alongside them the sanatorium provision made in each area, the latter being expressed in two ways: first with respect to the number of sanatorium beds per 100,000 of the population, secondly with respect to the number of beds per 1000 deaths from tuberculosis. Using the second criterion as the better measure, there appears to be a definite relationship between the accommodation existing for the treatment of patients and the total death-rate from the disease. Those provinces having the best sanatorium facilities have the lowest tuberculosis death-rate, and in 1901, before the introduction of sanatorium treatment, the same differences between the mortality-rates of the provinces were not apparent. The provinces making the largest provision for sanatorium treatment have recorded the greatest improvement in the death-rate. Dr. Macklin therefore suggests that the considerable expense which sanatorium treatment entails is justified, both for the better chance of recovery that it affords the patient and still more for the protection from infection which it confers upon the much larger group outside. She does not overlook the fact that this conclusion is justifiable *only* if all other factors contributing to tuberculosis mortality are identical in the groups compared with respect to sanatorium treatment. This proviso is vital to her thesis and, indeed, in her comparison of the tuberculosis death-rates with beds per 1000 tuberculosis deaths it is difficult to be sure which is the cart and which the horse. For instance, if the provinces made approximately equal provision of beds—and as measured per 100,000 of population the differences are not very large (except in Quebec)—the area with the lowest death-rate in 1921–29 and the greatest rate of improvement must inevitably show the highest number of beds per 1000 tuberculosis deaths, although

[1] Ministry of Health, Reports on Public Health and Medical Subjects, No. 64.

[2] Trans. of Amer. Hospital Assoc., 1934.

sanatorium provision may have played no part in the decline. It seems impossible to prove the complete absence of other factors contributing to the results shown—the fact that the provinces differ in one aspect of public health activity suggests that they may differ in others. The assumption that sanatorium treatment is the only variable appears a bold one: without it the case remains unproven.

## CORTICAL EXTRACT BY MOUTH

EXPERIMENTS recorded by A. Grollman and W. M. Firor [1] again raise the question whether extracts of suprarenal cortex can usefully be given by mouth to patients with Addison's disease. A dried cortical extract was used for many years at the Mayo Clinic with some apparent benefit as part of the Muirhead regimen; H. S. Stannus last year reported a case in which dried cortex by mouth seemed for a time to be more beneficial than injections of cortical extract; and J. M. Rogoff (1932) has found a glycerin extract of the cortex (interrenalin) "effective in prolonging life and relieving symptoms in advanced Addison's disease" when given orally. Levy Simpson [2] administered Rogoff's extract by mouth to one patient and obtained "definite and considerable improvement," but he found that subsequent batches of a glycerin extract prepared by other chemists produced, when given by mouth, "trembling, shakiness, pallor, tightness across chest, nausea and vomiting"—perhaps because it contained adrenaline. With G. E. Vilvandré, he showed that ingestion of a 1/1000 solution of adrenaline will sometimes cause colicky abdominal pain associated with jejunal contractions; and there may be similar pain when dried suprarenal gland is taken by patients with Addison's disease.

Grollman and Firor have found it possible to prolong the survival of adrenalectomised rats and dogs by giving them a preparation of cortical tissue through a stomach-tube, but the dose required was five times the dose for injection, and (contrary to the experience of Britton, Flippin, and Silvette with cats) the remedy was not effective when the animal was already prostrate with adrenal insufficiency. The refined extract is at present far too expensive for use under these doubtful conditions, and efforts were accordingly made to prepare cruder products which would be equally efficacious for oral administration. Unfortunately the suprarenal gland is apt to be highly toxic when ingested, because of the breakdown of adrenaline into phenolic derivatives, and before making the extracts it was necessary to take great care that all the medulla should be dissected away from the cortex soon after slaughter of the cattle from which the glands were obtained. With this precaution the crude extracts were almost as troublesome to prepare as a refined one. The next step therefore was to explore once more the possibilities of administering glandular tissue itself. The older clinicians used whole gland in Addison's disease, and without conspicuous success; but the reason why it was ineffective therapeutically apparently is that the cortical hormone is rapidly oxidised by enzyme action after death. Grollman and Firor claim to have got over this difficulty by destroying the enzyme with heat before it can do its work. After dissection from the medulla the cortex is conveyed (frozen in alcohol) to the laboratory and there ground up and dropped into boiling water. With the "enzyme-free" concoction thus obtained a dog was successfully kept alive over a long period, and it is thought that in cases of mild adrenal insufficiency in human beings such preparations might be valuable. But Grollman and Firor admit that the great amount of material which must be ingested "precludes their use in severe cases, in which, moreover, the occurrence of gastro-intestinal symptoms would render their oral administration impossible."

The evidence as a whole suggests that some extracts of suprarenal gland are of value, in not very severe phases of Addison's disease, when given by mouth. Too much must not be expected from this form of treatment in its present state of development; but the fact (referred to by Prof. E. C. Dodds in his Goulstonian lectures [3]) that a simple chemical modification of the œstrin molecule renders it more active by mouth permits us to hope for similar progress in other departments of endocrine therapy. E. C. Kendall and co-workers [4] at the Mayo Clinic report that they have isolated an active crystalline form of the cortical hormone, and state that it is probably an α-hydroxy aldehyde.

[1] Bull. Johns Hopkins Hosp., April, 1934, p. 216.
[2] Proc. Roy. Soc. Med., 1934, xxvii., 390.

## A SEVENTEENTH CENTURY PHYSICIAN

Claver Morris was born in Dorsetshire in 1659 and died at Wells, Somerset, in 1726, so that his life of 67 years covered five reigns. His father was a country parson who had served in the Civil war on the Royalist side as a cornet of horse. Morris matriculated at New Inn Hall, Oxford, in 1675, took his B.A. in 1679, his M.B. in 1683, and M.D. in 1691. In 1683 he became an Extra Licentiate of the Royal College of Physicians. He set up in practice at Wells as a consulting physician and wrote a diary dealing with events in his life between 1685 and 1726. This diary, edited by Dr. Edmund Hobhouse, has recently been published [5]; it contains his accounts, the names of all his patients, and the fees he received. We learn, for example, that the interment of the first Mrs. Morris in 1689 cost £50, of which £14 11s. was for gloves provided for the mourners. Until he married again Morris paid a widower's tax of 26s. a year. A house that he built for himself in Wells, and began in 1699, cost £807, and is still standing (1933) and in the occupation of one of the prebendaries.

The features of chief interest in this diary are admirably epitomised and expounded in a series of introductory chapters by Dr. Edmund Hobhouse, who brings to the task expert knowledge both medical and antiquarian. The reader is able to form an excellent idea of the kind of man Morris was, and of the conditions under which he lived. He occupied a good social position, did not operate or attend confinements, and seems to have occupied himself chiefly in writing prescriptions. He possessed a laboratory in his house and was evidently an expert pharmacist who spent much time in chemical experiment. The fees charged by him were strictly proportioned to the status of his patients—e.g., in Wells he charged the poor half a crown, the small tradespeople five shillings, the substantial townspeople and officials half a guinea, and the gentry and clergy a guinea. Dr. Hobhouse remarks that as the value of money then was four or five times that of to-day these fees were high. On the other hand, Morris's fees for country visits appear low—e.g., two guineas for a journey of 17 miles, and only 12 guineas for a

[3] THE LANCET, May 5th, 1934, p. 934.
[4] Proc. Staff Meet. Mayo Clin., April 25th, 1934.
[5] The Diary of a West Country Physician A.D. 1684–1726. Edited by Edmund Hobhouse, M.D. London: Simpkin Marshall Ltd. 1934. Pp. 155. 5s.

visit that took him away for nearly a week. After the first three years his total earnings were £200–£300 a year, so that Dr. Hobhouse thinks that for the last 15 years of his life Morris made the equivalent of over £1000 a year. As his three wives were all possessed of money, and Morris was an excellent business man, he became well to do, acquired a lot of land around Wells, and was on close terms of friendship with many of the county families.

Perhaps wisely, considering the state of medical knowledge at the time, Morris rarely mentions his patients' ailments; but his efforts to relieve them by bleeding, purging, clysters, sweating, or emetics are recorded. When these failed he had little else to offer. He was very fond of music and was the mainstay of a local musical society; in his will he expressed a wish that "A Consort of Musick of three Sonatas at least" should be performed in the room where his body was placed before it was carried out for interment. The impression derived from a study of his diary is that Morris lived a useful and prosperous life and deserved well of his fellow men, with whom he was obviously popular. He was buried in the cathedral, and, according to the fashion of the times, a highly eulogistic epitaph, in Latin, was inscribed on his monument in the cloisters of Wells.

## HEAT REGULATION IN THE TREATMENT OF GANGRENE

Two American physicians, Dr. I. Starr[1] and Dr. E. L. Sevringhaus,[2] have been treating gangrene of the lower limbs in a foot cradle constructed to maintain a constant temperature as nearly as possible that of the blood. Starr argues that wherever the essential lesion is in the peripheral vessels it is as important that the temperature should not rise too high as that the limb should be protected against cold: an excessively hot environment may produce cyanosis as surely as will exposure to cold, for the vascular disease prevents the increase of circulation that should accompany the increased metabolism of higher temperatures. The increased demand for oxygen is not satisfied, and pain, which has been relieved by a lesser degree of heat, returns as the cyanosis reappears.

The cradle, of which Dr. Starr has designed one pattern and Dr. Sevringhaus another, is equipped with a bimetallic thermoregulator, and the heat is supplied, as in the more usual type of bed cradle, by incandescent lamps. Reliance is placed on convection for the distribution of heat throughout the cradle, and the inaccuracy thus introduced is not more than 2–3° if the cradle is covered by the blankets. Starr has found some advantage in supplying oxygen to the limb for absorption through the skin. By a special modification of the cradle, cradle and limb are enclosed in a rubber bag, with all wiring and contact points outside the bag to avoid fire. The percentage of oxygen in contact with the leg is maintained at 60–80 by a fresh supply introduced three or four times daily; accumulation of moisture is circumvented by the introduction of copper wire trays holding calcium chloride, and wet gangrene is thus prevented. The cradle designed by Sevringhaus is a modification of Starr's, but on a considerably larger scale. It is a small chamber, covering all the lower part of the bed, and the feet and lower parts of the legs can lie in it without undue confinement, being visible through windows at the side; they are carefully separated from possible contact with hot and rough objects by means of baffles. Both authors are enthusiastic about the value of the constant temperature in the treatment of gangrene; it relieves pain and it promotes healing. Starr quotes five cases in which limbs were saved after amputation was thought to be inevitable on the observation of competent surgeons. Desiccation by the use of calcium chloride, may, he says, convert a wet into a dry gangrene and so prevent infection of the necrotic area.

[1] Amer. Jour. Med. Sci., April, 1934, p. 498.
[2] Ibid., p. 509.

## A MEMORIAL TO DR. HAIG FERGUSON

It is not given to many men to hold the place the late Dr. Haig Ferguson won for himself by the force of his personality. Skill in his own particular department of medicine earned the respect and honour of the whole medical profession in Edinburgh and far beyond. Less well known was the extent to which, as a wise and far-seeing philanthropist, he influenced and helped many hundreds of needy girls at a critical period of their lives. For over 40 years he identified himself with the fortunes and work of the Lauriston Home where both prenatal and postnatal care are provided for unmarried mothers and a refuge afforded to those who are often in the extreme of misery. This home, which is lineally descended from the St. Luke's Home, founded by Halliday Croom, has a somewhat precarious existence, being entirely dependent upon the slender payments of the inmates, along with such subscriptions as a rather restricted circle of friends contribute. These, being mainly due to the personal influence of Dr. Haig Ferguson, will now tend to cease. An appeal is now being made by an influential committee, of which Prof. R. W. Johnstone is chairman, for a sum of £5000 which would place the work on a lasting and permanent basis and perpetuate the memory of a great and good man.

Donations for the "Haig Ferguson Memorial Home" may be sent to Mr. R. H. Wallace Williamson, C.A., 37, Melville-street, Edinburgh.

## THE ISOLATED KUPFFER CELL

By the employment of a most ingenious device Peyton Rous and J. W. Beard[1] have been able to isolate and study the Kupffer cells of the liver in the rabbit and dog. The animal receives a series of intravenous injections of gamma ferric oxide a part of which is taken up and stored in the Kupffer cells. The liver is washed out with tyrode solution under low pressure. When the washings become clear of blood the pressure is raised and the Kupffer cells are loosened and washed out by alternately distending the liver with fluid and gently massaging the organ while the fluid is released. The Kupffer cells are next drawn out of suspension by causing the fluid to flow in a thin layer through a glass chamber under and around a long glass tube the outside of which is coated with a collodion membrane, while the inside contains a rod of soft iron. A giant eye magnet is fixed vertically beneath this chamber and, on passing a current, the iron rod in the tube becomes secondarily magnetised and the Kupffer cells collect on the collodion membrane.

The isolated cells were studied both by the supravital technique and by tissue culture in plasma and in serum. They appeared in supravital preparations as spherical or ovoid cells of about 30 to 40 μ though forms engorged with many particles might be as large as 100 μ. They flatten out on a glass surface and extrude a characteristic large circular membrane of

[1] Jour. Exp. Med., 1934, lix., 577.

clear cytoplasm which maintains a slow but constant motion compared by the authors with the flow of lava. They segregate neutral red promptly and in all respects are typical clasmatocytes but with certain morphological features that serve to differentiate them from clasmatocytes obtained from other organs of the body. The cells are extraordinarily sticky and cling to anything with which they come into contact. The stickiness of leucocytes, according to the authors, is negligible by comparison. They are also very sensitive to injury and withstand changes in temperature and pH only poorly. In tissue culture very little special activity was observed until the cells were brought into contact with a layer of lens paper. This seems to have stimulated them by providing a kind of window-ladder, and it was found that the healthy cells climbed from the floor of the dish in which they were placed on to the paper and spaced themselves at almost regular intervals along the surface of the fibres. They moved slowly along the fibres and tended to wrap themselves round those that were narrow, assuming a spindle form. It was rarely found that cytoplasmic processes of the cells extended between adjacent fibres, and this suggests that histologists are wrong in visualising the Kupffer cell as a cell that plants itself athwart the blood stream in the liver sinuses, attached by a few tentacles only to the adjoining wall. It is much more likely that the cell lies firmly like a slug along the wall. This view is supported by the observation that it is impossible to dislodge the Kupffer cells of the normal liver in appreciable numbers by forcible perfusion.

## ENDOMETRIOSIS

ENDOMETRIOSIS is the name given to the condition in which endometrial tissue, in the form of nodular or diffuse tumour-like masses, is found in abnormal situations. The tumours have no capsule, and though benign in structure, and usually in behaviour, may infiltrate surrounding tissues in clinically malignant fashion. Whether metastasis ever takes place is still uncertain. The ectopic endometrium undergoes decidual and menstrual changes, and these can be detected in superficial tumours, which increase in size and become tender at the menstrual period.

A distinction is generally made between internal and external endometriosis. It is called internal when endometrial tissue invades the wall of the uterus or Fallopian tube; it is external when it involves the external surface of the uterus or tube, the ovary, rectovaginal space, bladder, or intestine, or when it occurs extraperitoneally, in the groin, at the umbilicus, in laparotomy scars, in the vagina or perineum. The clinical features naturally vary with the location of the disease. Those of the genital type have lately been well described by H. Heidler.[1] The obstinate character of the dysmenorrhœa and menorrhagia—the chief symptoms—and their failure to respond to medical measures, diathermy and curettage are shown to be an important differential sign. Two of the rarer sites—the bladder and the scar of a laparotomy wound—are dealt with respectively by R. B. Phillips[2] and H. F. Harbitz.[3] Phillips has collected 29 cases of vesical endometriosis, including one of his own. Frequency and dysuria are the earliest symptoms, and are often cyclical; hæmaturia occurs later. The only means of differential diagnosis is by cystoscopy, and if necessary biopsy. Harbitz's monograph deals with external endometriosis in general, and especially with the form developing in scars. He desribes 17 cases of his own, and reviews 176 others. The condition is usually a sequel to operations upon the uterus or adnexa, especially such as involve opening the uterine cavity (subtotal hysterectomy, Cæsarean section); but in 15 cases it followed appendicectomy. Hysterotomy in early pregnancy seems especially liable to result in endometriosis of the scar; indeed, of Harbitz's 17 cases 14 followed this operation. He considers at length the various theories of the causation of external endometriosis, and concludes that implantation following the escape of viable particles of endometrium—whether by direct extension through the wall of the uterus or tube, or by retrograde menstruation, operation, or in other ways—suffices to explain all cases.

[1] Wien. klin. Woch., April 13th, 1934, p. 467.
[2] Jour. Obst. and Gyn. Brit. Emp., April, 1934, p. 165.
[3] Acta Chir. Scandinavica, 1934, vol. lxxiv., supp. xxx.

## INTRAVENOUS ALCOHOL FOR ACUTE BARBITURISM

IN a recent communication[1] to the French Academy of Medicine, Prof. Carrière, Dr. C. Huriez, and Dr. P. Willoquet, of Lille, gave an account of their clinical observations and animal experiments with alcohol as an antidote to the barbituric group of drugs. The case which first suggested this treatment to them was that of a woman of 23, who swallowed 5·0 g. of veronal and then 100 c.cm. of 95 per cent. alcohol to make sure. Instead of being comatose for at least 24 hours as she would have been had she taken this dose of veronal by itself, she slept only for five hours and recovered without more ado. Shortly after observing this case, the authors of this communication read an account by Dr. Le Loupp of a patient, a man aged 38, who irrigated an overdose of gardenal with cider, port, and brandy, drinking five or six glasses of the latter. In this case also the recovery of the patient seemed to be due to the conflicting action of the gardenal and the alcohol. It may be recalled in passing that injections of somnifene are beneficial in delirium tremens. The animal experiments consisted of injecting barbiturates into rabbits subsequently given intravenous injections of alcohol. The results were confirmatory of the clinical observations. Accordingly, on April 13th last, the first therapeutic attempt to exploit these observations was made on a woman, aged 22, brought to hospital in a state of slight coma. It transpired that she had taken 1·50 g. of gardenal. She was given an intravenous injection of 30 per cent. alcohol 20 c.cm. once an hour, and on the fourth injection she awoke to complete consciousness. The dosage in this case was known to be safe, for from 30 to 50 c.cm. of 30 per cent. alcohol have been given by intravenous injection with impunity for pulmonary suppuration. Though the optimum dosage remains to be determined, it is probable that at least 30 c.cm. of 30 per cent. alcohol should be given every hour till the patient awakes, the intravenous route being chosen to gain time.

## EFFECT OF EXTREMELY HIGH ALTITUDE ON MUCOUS MEMBRANES

IN order to study the effects of residence at a very high altitude on the upper respiratory tract, a study which he believes has not previously been made, Dr. Ernesto Raffo, of Lima, travelled to Casapalca, a mining centre in the Andes of Peru situated at a height of 13,621 feet above sea-level, where the barometric pressure is only 19 inches of mercury.

[1] Bull. de l'acad. de méd., 1934, No. 18.

He made observations [1] on residents already acclimatised, and on members of his party who had recently arrived from sea-level; the latter, however, could not be investigated thoroughly, as they all suffered from mountain sickness. In the majority of the inhabitants examined, the nasal mucous membrane was of a deep red colour, sometimes with a crusting secretion, and there was dilatation of the capillaries of the nasal system over Kiesselbach's area, which explained the liability to epistaxis; the soft palate was wine-red in colour, interspersed with little violet spots; there was a slight œdema and congestion of the uvula, and the vessels on the posterior pharyngeal wall were dilated. The hard palate was also congested, but to a less degree, as indeed was the whole of the buccal mucous membrane. Similar alterations were to be seen in the larynx, where the vocal cords were congested and streaked with vessels; a hoarse voice is common in these regions. Retraction of the drum was observed and, very constantly, hyperæmia of the membrane with dilatation of the vessels along the malleus. Chronic middle-ear and tubal catarrh, with deafness of the conduction type, is very frequent; such lesions are more marked in those with nasal obstruction or sinusitis, which are also of very common occurrence. In 14 natives he examined the sensitivity of the labyrinth by the caloric and rotary tests, and found it increased in nine cases. A similar, but slighter, hyperæmia of the mucous membranes was found in the people who had accompanied Dr. Raffo from Lima; no difference in acuity of hearing was detected, but the excitability of the labyrinth was increased. All these alterations are no doubt fairly to be attributed to the reduced atmospheric pressure and the extreme dryness of the air at this immense altitude. It does not follow that a moderate elevation has any harmful effect upon the mucous membranes.

## PRIMARY CÆCOSTOMY IN APPENDICITIS

ILEUS, whether paralytic or due to post-operative adhesions, is the most dreaded of all complications of acute appendicitis. E. R. Easton and W. J. Watson [2] believe that its occurrence can be predicted at the time of appendicectomy, and that by deliberate institution of a fæcal fistula a fatal issue can be prevented. The death-rate from appendicitis is causing much concern in the United States at the present time: the deaths per 100,000 of the population in 1929 had risen to the figure of 15·2, as compared with 11·8 in 1919. While recognising that the use of purgatives by the patient in the early stages of stomach-ache, and delay in operating, are two definite factors contributing to the high mortality from this disease, Easton and Watson have concerned themselves chiefly with improvement of operative technique. They believe that in the exercise of correct judgment in dealing, at the time of operation, with associated complications, there lies great hope of obtaining a successful outcome in even the worst type of case. Removal of the appendix is not all that is asked of the surgeon, and especially is this true where the appendix is either perforated or gangrenous, and where the condition is complicated by abscess-formation or by diffuse peritonitis. In an attempt to determine the factors that might assist recovery from complications Easton and Watson were struck by the fact that in a series of 100 complicated cases, 18 had fæcal fistula, either deliberately produced by operation or arising spontaneously, and that of these 18 patients only 1 died, though there were 12 deaths in the complete series of 100. The cases in which they advise primary cæcostomy or enterostomy are those in which the gut is distended, with a dull lustreless peritoneal coat and adhesions between the coils. Where the peritonitis is diffuse, they recommend that the opening should be at least a foot above the ileocæcal junction; in the more common condition, in which there is plastic peritonitis, or abscess-formation around the terminal ileum and the cæcum, they advise cæcostomy. They use Wagenstein's technique for enterostomy, a number 14 (French) catheter draining the bowel. Cæcostomy they perform through a stab-wound lateral to the main abdominal incision; here a number 20 (French) catheter is inserted, and after passing through the ileocæcal valve is guided into the ileum. A series of purse-string sutures hold it into position in the cæcum, and the latter is held to each end of the peritoneal wound by a catgut stitch.

The institution of intestinal drainage is said to forestall the onset of paralytic ileus, and, by preventing distension of the bowel by gas and fluid, to preserve its normal motion, and to avoid the formation of obstructive adhesions. As a rule no special difficulty is to be anticipated from the fistula. Most cases are said to heal spontaneously; about one in seven will require an operation for closure. Easton and Watson believe that a primary drainage of the bowel is so much more likely to be life-saving than a secondary drainage after the onset of symptoms of ileus, that its performance should be considered in every complicated case of appendicitis.

[1] Rév. sud-amér. de méd. et de chir., 1934, v., 91.
[2] Surg., Gyn., and Obst., April, 1934, p. 762.

## KING EDWARD'S FUND

THE Prince of Wales presided at the annual meeting of King Edward's Hospital Fund for London on Tuesday, when he announced that the Fund had again maintained its distribution at £300,000 entirely out of annual income. For the seventh year in succession the voluntary hospitals of London had shown a credit balance of income over expenditure, the balance for 1933 being the largest of the seven. The increase of income was no doubt partly due to exceptionally large legacies but other voluntary income was keeping very steady. Payment from patients continued to increase, either direct or through contributory schemes like the Hospital Saving Association which in 1932 paid the London hospitals £340,000. The King's Fund, said the Prince, was gradually coming to exercise some of the functions of a kind of central body for the voluntary hospitals of London, using its influence while respecting their individuality and their freedom. The activities of the Fund's propaganda committee included a fresh series of mock trials and the miniature hospital which was now touring in the north of England, and other schemes were in preparation. The parliamentary committee was promoting a general Bill authorising hospitals to provide pay beds for patients of moderate means. They had been told, he said, that the stream of voluntary gifts was drying up; recent gifts for building schemes suggested a kind of drying up which might well excite the envy of the Metropolitan Water Board.

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THE third Macewen memorial lecture of the University of Glasgow will be given by Prof. René Leriche, of the University of Lyons, on Tuesday, June 19th, at 4.15 P.M. Prof. Leriche will speak on experimental and clinical researches on angina pectoris and its surgical treatment. The lecture is open to past and present students of medicine and to others interested.

# THE PREVENTIVE ASPECTS OF MEDICINE

*A Series of Lectures in progress at King's College Hospital Medical School*

## XXV.—PUBLIC AGENCIES WHICH EXIST FOR THE PREVENTION OF DISEASE

THE public agencies which exist for the prevention of disease are now so numerous that little beyond their bare recital will be possible within the compass of a single lecture. It will be convenient to group them under 11 headings :

1. Those dealing with environmental hygiene and the purity of air, food, and water.
2. Control of the acute infectious diseases.
3. The medical supervision of expectant, parturient, and nursing mothers, and of infants and school-children.
4. Organised national schemes for the control of tuberculosis and venereal diseases.
5. The control of industrial diseases.
6. The National Health Insurance scheme.
7. General hospital provision and poor-law domiciliary medical relief.
8. Mental ill-health.
9. The prevention of blindness.
10. Medical research.
11. Education of the public in matters affecting health.

### Environmental Hygiene and Purity of Air, Food, and Water

Although the efforts of medical officers of health up to the beginning of this century were largely occupied in a struggle to improve environmental hygiene, yet a knowledge of the principles involved had been known from early times. The tragedy of the industrial revolution in this country was that urban communities were allowed to develop without any thought as to the penalty which would surely have to be paid later on for their failure to plan and control their areas and provide the amenities requisite for health.

As an indication of early knowledge on these matters, the Mosaic Law indicated that the ground used for dwellings must be free from accumulations of filth.

The elaborate arrangements made by the Romans for a supply of water to their cities are well known. Nineveh, which was a city centuries before Rome was, had a drainage system. Agrigentum, Athens, and Rome are all known to have had public drains. In the twenty-second Book of the Odyssey Homer describes the burning of sulphur by Ulysses, a process for purifying environment still carried out by sanitary authorities. Unpleasant smells were associated with outbreaks of disease—as indeed they still are—and so long ago as 1283, the City of London passed an ordinance to control the melting of tallow.

I would refer those who are interested in the early history of public health to Sir John Simon's classic book, "English Sanitary Institutions."

Responsibility for ensuring a healthy environment is now placed on the local sanitary authorities. These are the county boroughs—large towns which are independent of the county administration and which exercise within their areas all local government functions, including administration of the laws relating to public health, education, poor-law, highways, and, outside the metropolitan area, control of the police. They are responsible direct to the Ministry of Health and the other government departments concerned. With a few exceptions, such as Canterbury, they contain populations in excess of 50,000, and in the case of Birmingham the population exceeds a million.

Other sanitary authorities are the City of London, municipal and metropolitan boroughs, and urban and rural district councils.

All these sanitary authorities must appoint a medical officer of health and a sanitary inspector whose duties are set out in an order of the Ministry of Health. They have many executive functions and they advise their councils on matters within their province. The first of the duties of a medical officer of health is "to inform himself as far as practicable respecting all influences affecting or threatening to affect injuriously the public health within the district." He must also inspect his district to keep himself informed of the conditions injurious to health existing therein.

In what may be called large-scale operations, the county councils function in all areas other than those of the county boroughs. They must appoint a county medical officer of health. In certain parts of the country there are combinations of authorities for specified purposes, or ad-hoc bodies have been set up—e.g., for water-supply through the agency of water boards, for sewerage and disposal of sewage by drainage boards. There are also river pollution prevention boards, regional town planning boards, asylums and joint hospital boards, and so forth. If an analysis is made of the functions of local authorities it will be found that most of them have some relationship to the health of the community.

A brief summary of these functions with respect to this subsection of my paper is as follows :—

Securing an adequate supply of pure water for each household.

The making and enforcement of building by-laws to secure sufficiency of air space around a house, its sound construction, prevention of rising damp, &c.

The making and enforcement of drainage by-laws.

The construction of sewers and the disposal of sewage.

Provision for the collection and disposal of refuse.

The abatement of nuisances.

The prevention of nuisance from smoke.

The control by licensing and inspection of common and seamen's lodging-houses, of houses-let-in-lodgings, and offensive trades.

Administration of the Housing Acts, including the power to build new houses, the duty to abolish slums and rehouse those dispossessed, and to require the repair of houses where this is necessary.

The inspection of food prepared or sold in the district with power to seize and condemn unsound food and prosecute the vendor.

The taking of samples of food and drink for analysis by the public analyst, and prosecution of those selling food not of the nature, substance, and quality demanded.

The inspection and licensing of dairies, cowsheds, and milk-shops, and of bakehouses.

They also have power, and in some cases the duty, to provide public mortuaries, burial grounds, crematoria, parks and open spaces, baths and wash-houses, and so forth. Appointments of registrars of births and deaths must also be made. They also administer the law concerning canal boats, tents and vans, and other unusual places used for human habitation, and are responsible for town planning.

Speaking generally, these duties are carried out with considerable efficiency and much of the recent decline in the national death-rate may be ascribed to the enormous improvement in the environmental conditions under which urban dwellers live as a result of the activities of the local sanitary authorities.

### Control of the Acute Infectious Diseases

Much of the work of the pioneers of public health was devoted to the control of the spread of the acute infectious diseases. The cholera outbreaks in this

country of 1832, 1849, 1854, and 1866 profoundly stirred public opinion and were a direct cause of our early sanitary legislation. To-day this control of the acute infections may be discussed from two angles, first, the prevention of the introduction of disease from abroad, and, secondly, the steps taken to control the endemic acute infections.

With regard to the first, the original method was that of quarantine; the personnel of a vessel coming from an infected port was inspected, and if a case of plague, cholera, or yellow fever were discovered, the vessel was sent to a special mooring place and detained there for a considerable period. This was not only very costly for the shipowner but did not in fact prevent the spread of the disease, as illicit communication with the shore was very difficult to control.

More enlightened methods are now in use. Various international conventions have been held in order to secure uniformity of practice throughout the maritime nations of the world. The local agencies in this country for enforcing the law are the port sanitary authorities, each with its own medical officer of health. In most countries the port sanitary service is national and not local as in England and Wales, but the Ministry of Health keep close watch over this branch of public health and the national exchequer pays half the cost.

A vessel coming from a foreign port sends a wireless message to the port sanitary authority if there is any suspected infectious disease on board or any circumstances require the attention of the port medical officer of health; the message states the ports from which she has come and whether or not there have been, or are, cases of sickness on board. The customs officers also question the master of the vessel as soon as they board her, and in vessels without wireless, or if the sending of a message has been neglected, this may be the first intimation that there are cases of sickness on board. In cases where there is any reason to suspect the presence of infectious disease the port medical officer boards the vessel and examines all passengers and members of the crew before anyone is allowed to go ashore.

If a case of a serious infectious disease is found, the patient is removed to hospital and the passengers are not allowed to leave until they have supplied particulars of the addresses to which they are going. This information is then sent forthwith to the medical officer of health of the district to which the passenger is proceeding, and it is his duty to keep the person under surveillance, which for this purpose means daily inspection, until all risk of his contracting the infection has passed. During recent years the most common disease for which this procedure has been invoked is small-pox, and not infrequently long lists of small-pox contacts have been received in London, for distribution throughout the country, of passengers for England disembarked at Marseilles. Similarly, Plymouth, the Port of London, Liverpool, and Glasgow often despatch long lists to various parts of the country. If the crew is being paid off a similar procedure takes place.

One of the greatest trials of a port medical officer is when it is reported to him that dead rats have been found in, for example, a grain ship from the River Plate, or one which has come from India and the Far East. When this happens, all unloading of the cargo must cease, the rats must be examined for plague, and if this is found, a complete fumigation of the vessel with hydrogen cyanide must take place. Any passengers must be traced and put under surveillance, the crew must be kept under close observation, and every possible step taken to prevent rats from getting ashore. To lessen the risk of rats conveying plague from country to country, periodical disinfestation is now required or the production of a certificate—valid for six months—to the effect that the rats are so few that exemption from deratisation may be given.

The increasing use of aeroplanes as a means of rapid transport from country to country has added another risk of the introduction of serious epidemic diseases from abroad, and an international convention has recently considered the matter and made recommendations as to the most suitable methods of dealing with this menace. Speaking quite generally, the recommendations as to examination on entry to the country and surveillance of contacts follow the same lines as those successfully adopted for dealing with ships.

A function of port sanitary authorities which may be mentioned is the medical inspection of aliens. This is not primarily designed to detect cases of infection or contagion, though, in the early days, cases of trachoma in transmigrants were not infrequently seen, but to ensure that no alien is allowed to enter the country who is likely to become a charge, through illness, on public funds.

Akin to the above-mentioned methods for preventing the introduction of human diseases are those administered through the Ministry of Agriculture to prevent the introduction of diseases of animals which sometimes affect man. Rabies has now disappeared in this country, but it would almost certainly reappear if dogs from abroad were allowed free access. All such dogs must spend some months in quarantine before they are allowed to proceed beyond the port of disembarkation. The illegal introduction of dogs from abroad by aeroplane has been attempted, and firm steps have had to be taken to prevent this. As a result of the occurrence of cases of psittacosis, an order has been issued controlling the importation of parrots.

The control of indigenous infectious disease is a matter which concerns all sanitary authorities, and this occupies much of the time of local health officers.

We must first consider what steps are taken to immunise individuals against infectious disease. The vaccination laws date from 1840. We still pay lip service to compulsory vaccination of infants, but where the parents conscientiously object, exemption is readily obtainable and at the present moment less than 50 per cent. of the infants of the country are vaccinated at the public expense by the public vaccinators and those exempted exceed those vaccinated. In fact, the position is so ludicrous that many are now of opinion that we should give up all pretence of requiring compulsory vaccination by statute and simply provide free vaccination for those who would like it.

Local sanitary authorities have power to provide facilities for Schick testing and immunisation against diphtheria, and many are developing this side of their work though public apathy is great and progress is slow.

In chronological order, the first great step taken by public authorities for the purpose of controlling the acute infections, after the provision of facilities for vaccination, was the provision of fever hospitals, most of which date from 40 to 50 years ago. The reason was because at that time scarlet fever was very prevalent and had a very high case-mortality rate. It was thought that the isolation of the patients in hospital would soon bring an epidemic to an end. Unfortunately, experience and a better knowledge of epidemiological laws have shown that that was a vain hope. Most of the susceptible intimate family contacts have already been infected before the patient is removed from home, and for this reason and owing to the existence of missed mild cases the prevalence of scarlet fever has been but little affected by the provision of isolation hospitals. These hospitals are, however, of great value in the treatment of serious cases of the acute infectious diseases. Fortunately, scarlet fever is now of a much milder type than it was a generation ago, though even in this disease severe complications can be prevented by efficient hospital treatment. Cases of diphtheria and typhoid fever are admitted to isolation hospitals and in many areas measles and whooping-cough also.

In fact, many think that where fever hospital beds are limited, complicated cases of measles and uncomplicated cases from unsuitable homes should have a prior claim to admission over uncomplicated cases of scarlet fever.

It is the duty of the medical officer of health of a sanitary authority to take such measures for the prevention of any infectious disease as he is legally authorised to take under any statute in force in the district or by any resolution of his council. In order that he may do this, he must know where the cases of "fever" are, and this he does by means of the "notifications" which he receives from the doctor in attendance (incidentally notification is also required from the head of the household, though in practice it is always left to the doctor). Compulsory notification, under penalty, of certain acute infectious diseases has been statutory since 1899. There is a procedure by which diseases may be added to the list. For example, chicken-pox is often added during the prevalence of small-pox. Measles and whooping-cough are not compulsorily notifiable in most districts, though a few have added them to the list either in respect of every case or of the first case in a family.

Certain diseases are compulsorily notifiable throughout the country under orders made by the Minister of Health. Examples are puerperal pyrexia, acute primary pneumonia, and malaria. A full list of diseases compulsorily notifiable in any district may be obtained on application to the local medical officer of health, who will also supply the necessary forms.

On receipt of a notification the medical officer of health, or more often a sanitary inspector or health visitor, visits the house and completes an inquiry form from which it is desired to learn :—

(1) The date of onset of the disease;
(2) The source of the infection;
(3) The persons with whom the patient has been in contact since he became infectious; and
(4) The steps taken to prevent the spread of the infection.

These forms are studied by the medical officer of health and the necessary action taken thereon. It may be that a "missed" case will be discovered, that the milk-supply or shell-fish are under suspicion, that better arrangements for home isolation are desirable, and so forth.

We are, however, in a changing world with regard to the control of a disease like scarlet fever. The value of removal to hospital is being questioned, as is also that of terminal disinfection. Fumigation by sulphur dioxide or formaldehyde was a universal requirement 20 years ago, but in some areas it is being discontinued. Again, it was thought at one time that the desquamating skin of scarlet fever cases was infectious and the patients were detained in hospital until all desquamation was completed—sometimes for eight or nine weeks and nearly always for six. It has been found by experience that the desquamating skin is not infectious and that it is safe to discharge an uncomplicated case on the twenty-eighth day. Serum treatment is now largely used in fever hospitals for preventing complications and shortening the period of treatment.

I must mention three more points before leaving the acute infectious diseases :—

(1) Diphtheria antitoxin may be supplied free by the local sanitary authority for use by private practitioners.

(2) Most authorities make arrangements under which free facilities are provided for obtaining bacteriological reports on specimens sent by private practitioners such, for example, as reports on throat swabs, on cerebro-spinal fluid, on blood-serum for agglutination tests, and so forth.

(3) A sanitary authority does or can do little to control one of the most serious of the acute infectious diseases—namely, influenza. Influenza itself is not compulsorily notifiable, though acute influenzal pneumonia is. The action of the sanitary authority in times of epidemic consists mainly of endeavouring to secure as much hospital accommodation as possible, and of advising the public of the dangers at such times of frequenting places which are crowded and ill-ventilated. Those who have developed the disease are counselled to remain at home in bed until the risk of spreading the infection has passed, and thus, incidentally, protecting themselves against the risk of serious complications.

W. ALLEN DALEY, M.D., M.R.C.P., D.P.H.
Principal Medical Officer, Public Health Department, London County Council.[1]

*(To be concluded)*

# THE SERVICES

## ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. H. L. P. Peregrine to *Victory*, for R.N.B.

Surg.-Lts. H. E. B. Curjel and H. de B. Kempthorne to *Pembroke*, for R.N.B.

## ROYAL ARMY MEDICAL CORPS

Lt.-Col. A. E. B. Jones, having attained the age for retirement, is placed on retd. pay.

Maj. S. J. Barry to be Lt.-Col.

The undermentioned Lts. on prob. are confirmed in their rank: G. L. McLeod and C. B. R. Pollock.

Lt. P. V. O'Reilly resigns his commn.

### ARMY DENTAL CORPS

Lt.-Col. A. R. Inglis retires, receiving a gratuity.

Maj. D. Clewer to be Lt.-Col.

Capt. J. W. Vasey to be Maj.

## ROYAL AIR FORCE

Flight Lt. A. A. Townsend is promoted to the rank of Squadron Leader.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: T. C. Macdonald and J. S. Carslaw.

## DEPUTY DIRECTOR-GENERAL, A.M.S.

The War Office announces that Col. W. P. MacArthur, D.S.O., F.R.C.P.I., hon. physician to the King, who is at present consulting physician to the Army and professor of tropical medicine at the Royal Army Medical College, has been appointed deputy director-general, Army Medical Services, with effect from Sept. 16th, 1934, in succession to Col. F. D. G. Howell, D.S.O., hon. surgeon to the King, who, on completion of his temporary tenure of the appointment, will proceed to India to take up the appointment of deputy director of medical services at Army Headquarters which will become vacant on Dec. 26th next. Col. MacArthur will be succeeded by Lt.-Col. J. Heatly-Spencer, R.A.M.C.

## THE LEISHMAN PRIZE

Maj. F. McKibbin, Royal Army Medical Corps, has been awarded the Leishman Prize for the year 1933, consisting of a silver medal and a sum of £30 for his work in the interests of military hygiene.

The Leishman Prize (Officers) is awarded annually for the best piece of work in any branch of Medicine, Surgery, or the allied sciences, or in connexion with the general duties of the Royal Army Medical Corps, by an officer of the Royal Army Medical Corps, or Army Dental Corps, or by an officer removed from either of these Corps but still on the Active list.

## NORTH PERSIAN FORCES MEMORIAL MEDAL

Surg. Lieut.-Com. S. G. Rainsford, Royal Navy, has been awarded the North Persian Forces Memorial Medal for the year 1933, for his paper on Laboratory Methods of Diagnosis of Brucella Infections, published in the *Journal* of the Royal Naval Medical Service, January, 1933.

The North Persian Forces Memorial Medal is awarded annually for the best paper on Tropical Medicine or Hygiene published in any Journal during the preceding twelve months by a Medical Officer, of under twelve years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service, provided the Memorial Committee consider that any of the papers published has attained a standard of merit justifying an award.

[1] In order to comply with the Council's Standing Orders it is necessary to state that the London County Council accept no responsibility for the author's opinions or conclusions.

# SPECIAL ARTICLES

## GENERAL MEDICAL COUNCIL

SUMMER SESSION, MAY 29TH–JUNE 2ND, 1934

### Penal Cases

#### A DIVORCE DECREE

*The Case of Laurence Handley Ashken*, registered as of 28, Hillside-drive, Edgware, Middlesex, L.M.S.S.A. Lond. 1927, who had been summoned to appear before the Council on the following charge :—

"(1) That being a registered medical practitioner you frequently committed adultery between September, 1931, and January, 1933, with Stolzie May Ferris, a married woman, whom you were attending professionally, of which adultery you were found guilty by the decree of the Probate, Divorce and Admiralty Division (Divorce) of the High Court of Justice, dated February 12th, 1934, in the case of Ferris *v.* Ferris and Ashken, in which you were the co-respondent. (2) That by reason of the said facts you abused your position as a registered medical practitioner. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was Mr. Francis Spaul Ferris.

Dr. Ashken appeared in answer to his notice and was accompanied by Mr. Victor Williams, counsel, instructed by Messrs. G. and A. Cosens, solicitors.

Mr. Harper, opening the case, said that he could not understand on what respondent relied for his defence, as both adultery and professional relationship were admitted.

Mr. Ferris, the complainant, gave evidence showing that the acquaintance between his wife and respondent had arisen out of professional relationship. They had all three become very friendly. His wife had confessed to adultery one Sunday morning, and Dr. and Mrs. Ashken had been summoned to the house for a discussion. Respondent had flatly denied the charge at first, he had declared that it was possible for a woman in her condition to imagine such an event, and suggested that she had had intercourse with other men and was imagining that it was respondent. Complainant had told him to leave the house, and had subsequently had his wife examined by another doctor who had found her of sound mind. He had therefore asked his wife to leave the house and had instituted divorce proceedings. A little later Dr. Ashken had rung up his office and the line had been tapped and the conversation recorded. Dr. Ashken had said he wished to confess, and had later called at the office in a very distressed condition and confessed and asked forgiveness. He had eventually consented to make a written statement. (An official from the Divorce Court produced the statement and Mr. Ferris identified it.) Later respondent had met him at North Wembley station and asked if he might make a public apology in the press, but complainant had refused and had obtained a decree nisi. Dr. Ashken had broken up his home. Cross-examined by Mr. Williams, he said that his wife's moral character had been entirely satisfactory until she met respondent. He did not deny that Dr. Ashken had twice suggested he should give up the case, but denied that he had given it up or that they had ever sent for another doctor before Dr. Ashken. He agreed he had divided the blame equally between respondent and Mrs. Ferris.

Dr. Ashken, giving evidence, said that Mrs. Ferris had come to his consulting room in August, 1931, complaining of severe vaginal discharge. Friendship had developed. He had several times suggested that another doctor should take over the case, while the friendship continued, but Mr. Ferris had always refused. Adultery had been committed four times only. He bitterly repented what he had done and was much ashamed of himself.

In answer to the Legal Assessor, he admitted that he had denied adultery at the first interview.

Mrs. E. A. Ashken described two telephone conversations which she had overheard between Mrs. Ferris and her husband ; in both, Mrs. Ferris had said that Mr. Ferris would not take proceedings if she (Mrs. Ashken) would leave her husband, but she had not done so.

Sister Margaret Bethan described Mrs. Ferris's nervous condition and her infatuation with Dr. Ashken. She had nursed three or four hundred cases for respondent and his conduct had always been most professional. Miss Kathleen Sell, formerly a nurse, described Dr. Ashken's treatment of about two hundred cases in a local nursing-home as quite unobjectionable. Mrs. Ferris had been very unsatisfactory as a patient, often refusing treatment and then telephoning for the doctor to return at once. The vicar of Kenton and several patients testified to Dr. Ashken's high character and reputation and their trust in him. Dr. Arthur Whitesides, who had been Dr. Ashken's assistant for six months, declared that his conduct had been above reproach in every way, and amplified his opinion under cross-examination. Dr. J. Sakula gave evidence that he had also been assistant to Dr. Ashken and had attended Mrs. Ferris, finding her very difficult and troublesome. Dr. Samuel Halperin, formerly Dr. Whiteside's assistant, testified to the high reputation of Dr. Ashken among former patients. Mr. Williams also put in a number of statutory declarations as to character from medical men, and addressed the Council, arguing that his client had been tempted and tried beyond human endurance.

Mr. Harper addressed the Council, deploring the fact that so many responsible persons—witnesses and those sending statutory declarations—should attempt to minimise the gravity of adultery, which was admitted.

After deliberation in camera the President announced that the Registrar had been directed to erase from the Register the name of Laurence Handley Ashken.

#### ALLEGED ADVERTISING

*The Case of James Stansfield Collier*, registered as of 30, Wimpole-street, London, W.1., M.R.C.S. Eng. 1894, L.R.C.P. Lond. 1894, who had been summoned to appear before the Council on the following charge :—

"(1) That being a registered medical practitioner you authorised and/or acquiesced in the publication in the *Observer* of Jan. 7th, 1934. of an account of an interview with you headed 'Sleeplessness : Drugs which prevent it : Safety and Danger.' (2) That you thereby advertised for the purpose of obtaining patients with a view to promoting your own professional advantage. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was Mr. Maximilian Fourman.

Dr. Collier was accompanied by Mr. Oswald Hempson, solicitor, on behalf of the Medical Defence Union.

Mr. Fourman read his statutory declaration in the witness-box. He said he was a Russian advocate who had married a British woman and had been employed in insurance offices here. His son was

physically and mentally defective and they had consulted Dr. Collier and found him unsatisfactory. The article in the *Observer* had made them think that respondent was a scientific man who knew about drugs. But for that article they would never have wasted their time consulting such a man. The next victim might be some poor English workingman who would not dare to express disapproval of a name followed by so many letters. Complainant also read the letter he had written to Dr. Collier, describing his child's case in great detail, before the consultation. At the request of the President, he then read out the article from the *Observer*.

The Registrar read Dr. Collier's reply to the letter, admitting the interview and its publication but maintaining that nothing in the article could be regarded as advertising. Mr. Fourman's son had proved to be a mentally defective epileptic who was being quite properly treated by his doctor with luminal.

Mr. Fourman addressed the Council, saying that he played the part of the man who called the fire-brigade when he saw a fire. He thought his duty would have been fulfilled by drawing the Registrar's attention to the article, and had not anticipated having to take part in proceedings. He contrasted Dr. Collier's treatment of him with the code of conduct instilled into members of the Russian Bar. He had been treated most hospitably in England and hoped Dr. Collier would not be too severely punished. Anything the Council could find in respondent's favour would cause complainant great happiness.

Mr. Hempson called Dr. Collier as a witness and Dr. Collier explained the circumstances under which the article had been written. He had granted an interview because he thought the public was getting a wrong impression of the danger of certain drugs. They were being much discussed in the lay press and many of his patients distrusted them and refused to take them, so that his treatment was handicapped. He had gone carefully over the journalist's written account of the interview and had given permission for his name to be used. The article correctly represented the interview as far as the inverted commas went. He had not authorised any setting forth of his own capacities. A proof had been submitted and called for but he had no recollection of seeing or correcting it. Mr. Fourman's account of the consultation was substantially correct; he had examined and prescribed for the boy and taken fairly full notes. He had told complainant that he should have written beforehand if he knew he could only afford one guinea. He had had one other patient as a result of the article—a hopeless drug addict—and had taken no fee, nor had he received any fee from the *Observer*. There was emphatically no idea of attracting patients; he was not in financial need of patients and had as much work as he could do. He admitted unwisdom in letting this article go through without proper scrutiny.

The Legal Assessor pointed out the opening paragraphs, not in inverted commas, and Dr. Collier said those had been added and had not been in any script seen by him. (They referred to him as a noted specialist.)

Mr. Hempson read a statutory declaration from the representative of the *Observer*, confirming Dr. Collier's account of the interview and its reasons. The maid had handed him back the draft article in its original envelope, unaltered and unsigned, saying that Dr. Collier had been unexpectedly called away. He took full responsibility for the opening paragraphs which he had added without Dr. Collier's knowledge.

Mr. Hempson argued that there was no "criminal intent" in the matter. Nobody who knew respondent would think it possible that this article would be to his advantage.

After deliberation in camera the President announced that the Council had found the first charge proved, but not the second. Dr. Collier had allowed publication of an unwise article which had inevitably laid him open to these proceedings, but the Council accepted his assurances as to motive, and left the matter there.

### CHARGES OF CANVASSING

*The Case of Malcolm Herbert Cecil Dyson*, registered as of Lyemun, St. Mawes, Cornwall, M.R.C.S. Eng. 1926, L.R.C.P. Lond. 1926, B.S. 1927, M.D. 1929, U.Lond., who had been summoned to appear before the Council on the following charge:—

"That being a registered medical practitioner you have canvassed personally and/or by means of an agent the patients of David Morrison with a view to inducing such patients to become patients of yours, and in particular: (1) In or about the months of November, 1933, and February, 1934, you canvassed William Francis Butland; (2) in or about the month of February, 1934, you canvassed Henry Hooper; (3) in or about the early part of February, 1934, you canvassed William Henry May; (4) in or about the month of February, 1934, you canvassed James Sara. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was Mr. David Morrison, M.B. 1894, U.Lond. Dr. Dyson was accompanied by Mr. Oswald Hempson, solicitor, for the Medical Defence Union.

Dr. Morrison opened his case, complaining of most unfriendly treatment from respondent who had, he alleged, tried to drive him out of the place and carried on the most outrageous canvassing of complainant's patients. Complainant had brought four statutory declarations but had only been able to bring two witnesses from St. Mawes. He submitted that Dr. Dyson's letter to the Registrar amounted to a confession and revealed motive, and the intention to wreck his small practice and make it unsaleable in the fear that a young, energetic man might buy it and offer the respondent serious opposition. He read his letter offering to stop proceedings if respondent would make amends and described an effort on the part of the vicar to negotiate. He read out correspondence with the local nursing association dealing with his assertion that a nurse had told a patient that respondent was "the" doctor of the association.

Dr. Morrison entered the witness-box and was cross-examined by Mr. Hempson. He said he had first gone to St. Mawes in May, 1932, as locum tenens for the deceased Dr. Murray and had carried on the practice for three months. Some days after leaving he had returned and set up in practice for himself. He had offered to purchase the practice, which was producing about £300–£350 a year. His present practice was about the same size, but that did not mean that he had secured practically the whole of that practice. He did not suggest that respondent was unfriendly during his locum period. He had set up in practice there because Dr. Dyson and his partner had, for a year before Dr. Murray's death, been scheming to spoil the practice of a dying man, so that the practice for which Dr. Murray had paid £1200 was only bringing in about £300 at the time of his death. Dr. Dyson and his partner had eventually bought the practice, after complainant had told them he had no intention of setting up in practice there. He admitted having received a letter from the British Medical Bureau saying that

for him to set up in practice at St. Mawes would not only be contrary to medical etiquette, but also in contravention of the terms of their introduction of him as locum. He thought Miss Murray had played him a dirty trick in selling the practice to Dr. Scott and Dr. Dyson after asking him to make an offer, although he agreed his offer was a very poor one and he had not expected it to be accepted. He denied that there had been a meeting of doctors in Falmouth about his advertising methods and that the profession there had refused to recognise him. He admitted that his letter to respondent demanded amends or compensation as an alternative to these proceedings, and that the proceedings were punishment of Dr. Dyson.

The Legal Assessor asked what complainant would say in answer to the defence that Dr. Dyson had been seeking to protect his own patients rather than attract complainant's. Dr. Morrison replied that his action in starting practice at St. Mawes might have been unconventional, but he was free to set up where he liked. He agreed that he had started practice a month after Dr. Dyson and his partner had bought the practice of Dr. Murray.

Sir Henry Brackenbury asked if complainant had seen the four people named in the charge while he had been a locum. Dr. Morrison replied that they had all been Dr. Murray's patients; he could not be sure whether he had attended them or not.

William Francis Butland gave evidence that Dr. Dyson had twice approached him, asked why he was not on his (respondent's) panel, and said that Dr. Morrison had no business there. Witness had said he had no wish nor reason to change. In reply to Mr. Hempson, he said that they had shaken hands at the end and been quite friendly.

William Henry May gave evidence that Dr. Dyson had told him he ought not to be on Dr. Morrison's panel, that Dr. Morrison had no business there and would have to go, and that witness should transfer to respondent's list. Respondent had had to ask his name, not knowing him personally.

Dr. Morrison put in two statutory declarations from aged patients too ill to travel, describing similar attempts to canvass.

Dr. Dyson, giving evidence on his own behalf, said that he had looked after Dr. Murray's patients gratuitously during his illness and that he had been offered the lighthouse appointment after his death and had refused it until Dr. Murray's affairs should be settled up. As a result of the usual letter sent round by the Panel Committee after he had bought the practice, some 160 out of 315 patients had transferred to him. The panel was the most important part of Dr. Murray's practice. He admitted having seen the four patients mentioned in the charge and had spoken to them because he had made a point of telling all these people the truth. He had never attempted to persuade anybody to join his panel. There had been a strong rumour in St. Just that Dr. Morrison had bought Dr. Murray's practice, and he and Miss Murray had gone round to tell the facts. They had proposed to send round a circular letter on this point. He and his partner, Dr. Scott, had bought the practice, and the first notification they had had of Dr. Morrison's return was a letter to Dr. Scott. They had offered him the practice at the price they had paid for it, but he had refused. They had appealed to the British Medical Association and the Panel Committee, but neither had been able to help. Dr. Morrison had soon tried to sell his practice and respondent had advised an applicant to see the British Medical Association before buying it.

Cross-examined, he said that after his predecessor's death there had been an interval during which Dr. Murray had been the only doctor in St. Mawes. His only object in going round was to tell the truth, and no patients had transferred to his panel in consequence. He had taken every possible step to prevent complainant selling his nucleus.

In reply to the Legal Assessor, he agreed that he knew in November, 1932, that some 150 of Dr. Murray's former panel patients had not transferred to his panel on Dr. Murray's death and presumably did not want to. He admitted that he had been in error in not approaching these patients until November, 1933, 12 months or more after they had changed to Dr. Morrison. It was only gradually, however, that he realised that the people of the district thought Dr. Morrison had bought Dr. Murray's practice. Frankly, he had taken the law into his own hands at that stage.

Dr. F. S. Scott, Dr. Dyson's partner, said that a branch of his practice had been established in St. Mawes in 1925, before Dr. Murray had gone there, and there had been continuity of that practice ever since. Dr. Murray had introduced opposition. He had himself asked Dr. Murray's executors to put in a locum so that there might be no suggestion that they wanted to get the work for themselves. He had offered Dr. Morrison the practice at the price they had given for it and promised not to interfere with him. Until quite recently there had been a persistent belief that Dr. Morrison had bought it. Dr. Dyson and he had acted together, advisedly, as they could see no other way of righting a wrong. He had wanted to prevent Dr. Morrison from selling something he had never bought. From the first he had regarded it as their practice and not as Dr. Morrison's.

After Mr. Hempson had addressed the Council, and it had deliberated in camera, the President announced that the case was dismissed, the facts not having been proved to the satisfaction of the Council.

*The Case of William Samuel Dixon*, registered as of The Surgery, Fifth-street, Horden, Co. Durham, M.B., B.Ch. 1923, U.Dub., who had been summoned to appear before the Council on the following charge:—

"That being a registered medical practitioner you have systematically canvassed during the months of February and March, 1934, in and around the district of Horden in the County of Durham, by means of an agent or agents, the patients of Dr. A. M. Wilson, Dr. G. C. Henry, and Dr. William Martin, with a view to inducing such patients to become patients of yours, and in particular: (1) On or about Feb. 27th, 1934, you canvassed John Henry Burnham, a patient of the said Dr. A. M. Wilson; (2) on two occasions in or about the month of March, 1934, you canvassed Henry Kaye and his wife Mrs. Emma Kaye, patients of the said Dr. A. M. Wilson; (3) at the end of February or the beginning of March, 1934, you canvassed Mrs. Ethel May Rudd, a patient of the said Dr. G. C. Henry; (4) on or about March 3rd, 1934, you canvassed Kitty Tatters, a patient of the said Dr. William Martin. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainants were the London and Counties Medical Protection Society, who were represented by Mr. T. Carthew, counsel, instructed by Messrs. Le Brasseur and Oakley, solicitors. Dr. Dixon appeared in answer to his Notice and was accompanied by Mr. Oswald Hempson, solicitor, for the Medical Defence Union.

Mr. Carthew explained that respondent and Dr. Wilson had been partners from 1925–1934, but negotiations for continuation had failed and the

partnership had ended by effluxion of time. Respondent had set up in practice alone. All four doctors had similar practices, consisting of four types of patient: (1) panel; (2) colliery club (the families of insured men), the money being paid by the colliery; (3) private club patients; and (4) private patients. After a while the three doctors had become aware of a wholesale door-to-door canvassing campaign carried on by respondent. They had written to him about it, and he had replied that it was the only way to find out which were in fact his patients, and that the club patients had to be notified of the dissolution of partnership; he said that he had consulted a solicitor and members of the ethical and panel committee before acting, and the visitation was one of inquiry and notification only and not of canvassing. Mr. Carthew could prove, he thought, that the colliery could have been asked to supply a list of the patients of the partnership, and a circular could then have been sent to them, to fulfil the articles of partnership which required notification of dissolution to all patients. The fact was that practically every house in Horden had been visited. Dr. Wilson had had no part in or knowledge of this proceeding. It was not yet possible to tell the effect on the panel patients, but the colliery club figures showed that the former partnership had had 1390 patients, of whom 1183 had transferred to Dr. Dixon. The private club had had some 250 members, of whom only 28 had remained with Dr. Wilson.

Dr. A. M. Wilson said that he had been in practice in Horden since 1915, that respondent had come to him as assistant in 1923 and had been his partner from 1925–1934. He had known nothing of any canvassing plan. He had from time to time obtained lists of the club patients from the cashier of the colliery, and produced specimen lists. There would be no difficulty, so far as he knew, in Dr. Dixon getting a list if he had gone the right way about it. A notice of dissolution of partnership had been displayed in the surgery. He confirmed the transfer figures. Cross-examined by Mr. Hempson, he agreed that Dr. Dixon had been doing the bulk of the work of the partnership, and might be expected to get more patients than himself on its dissolution. In the absence of addresses it would be impossible to trace the patients from a list of names. He had not complained to the local ethical committee. He had sent his collector round from house to house after the dissolution to find out which patients were staying with him. He did not recall speaking to the dispenser about Dr. Dixon. Re-examined, he said he had not put much activity into the work since the death of his wife two years before the dissolution, but he had worked every day, walking his rounds. His collector had not visited at every door but only a given list of addresses.

In reply to the Legal Assessor, he said he had never applied to the colliery for a list of patients and been refused.

Dr. G. C. Henry said he had obtained lists of patients from the colliery without delay or difficulty. He produced the books, corrected by the colliery clerks. Dr. Dixon was a very active opponent. He himself had set up in practice in Horden a few months after his brother had ceased to be assistant to Dr Wilson, who had later complained to the Central Ethical Committee about witness. Dr. Dixon had been anxious to give evidence against him in that case and had later complained of witness's criticism of him to a patient. He had brought an action against Dr. Dixon and been awarded £50 damages. The panel committee had inquired into the canvassing charge and had decided that there was no case to go to the Ministry; the visits had been indiscreet if not irregular, but no attempts had been made to influence patients. Miss Wearmouth was his servant. He had prepared a statement for Kitty Tatters to sign, but it had never been signed. He admitted that Dr. Martin's partner had complained to the Ethical Committee that witness had canvassed.

Dr. W. Martin also testified to having applied for particulars from the colliery and having obtained them with ease. Cross-examined, he said that the list was a joint one between himself and partner; they received a joint cheque and the colliery had no knowledge of which patient belonged to which doctor. After the war he and Dr. Wilson had been the only doctors in the district and the lists had got rather mixed up; witness described the way the doctors had managed to sort them out. He had not employed a Mr. Edward Malone to go round visiting and inquiring.

In reply to the Legal Assessor, he said that he and his partner divided their patients into two districts, each taking one, subject to choice by the patient. A list from the colliery would be a practice list, but each partner could tell roughly which patients preferred him; the great majority did not mind which they saw. The list could not be accurately divided into two. In reply to Dr. Bone, he said the junior partner could get the list just as easily as the senior. In reply to Sir Henry Brackenbury, he said the lists supplied were fairly accurate, but not so inaccurate as to necessitate a house-to-house visitation to ascertain the patients.

Mr. Henry Kaye testified that he had been asked by Mr. Carruthers to change from Dr. Wilson to Dr. Dixon; he and his wife had refused. Cross-examined, he agreed he knew Mr. Carruthers well; on the second occasion Mrs. Herbert had also been present. He had no grudge against Dr. Dixon.

Mrs. Kaye confirmed her husband's evidence.

Mrs. E. M. Rudd also declared she had been asked to change doctors.

Mr. Carthew read a statutory declaration from a witness not present and asked leave to call a number of witnesses who had not made statutory declarations. Mr. Hempson objected, as he had had no proof of the evidence. The Legal Assessor advised the Council not to accept this evidence.

Miss L. I. Wearmouth, a domestic servant in the service of Dr. Henry, described a visit of the collector to her friend, Kitty Tatters, in her presence, Kitty Tatters being on Dr. Martin's panel. She had told Dr. Henry and signed a statement. Kitty Tatters next day had wanted to destroy the statement, as all her family were on Dr. Dixon's panel.

Dr. Dixon, examined by Mr. Hempson, said that he had started with a one-third share, increased to one-half, and under the new agreement was to have two-thirds and an assistant. He had had a very large practice and panel list. For the last four or five years he had done three-fourths and for two years five-sixths of the work. In the last year he had done all the night work and 130 confinements to Dr. Wilson's two; he had taken three hours morning and evening at the surgery where his partner had taken half an hour. The negotiations had only broken down because he had wanted the assistant to come with a view to partnership and Dr. Wilson would not agree. Very few of the patients would see a notice hung in the surgery. He had seen the clerk to the Durham Insurance Committee, who had arranged to circularise the panel patients. The private collector at his last visit to private club

patients had been instructed to inform them. He had visited the colliery manager, Mr. Best, and tried to get the change-over of the colliery club patients made at the colliery office, as had been done in another case but without success. He himself had never seen a list, and if Dr. Wilson had ever received a list it was without respondent's knowledge. He had had no list himself and had seen no way of getting one but sending visitors round. He had told them to call at all the colliery houses. (About 95 per cent. of the population lived in colliery houses, council houses, and scheme houses, and were constantly changing their homes.) He had told them to ask first of all if the inhabitants were patients of Drs. Wilson and Dixon, and if the answer was No they were to leave at once. If Yes, they were to ask which doctor the patient would choose on dissolution of the partnership. They were told not to say which doctor they represented until the patient had made his choice. If the patient chose Dr. Wilson they were to pass on, as the money at the colliery was already deducted in Dr. Wilson's name. On no account were they to interfere with panel cards. Nothing was done after March 6th, as the Medical Defence Union had advised him on that day that the procedure was undesirable. His visitors had collected 510 pit notes out of the 1380 pit patients on the joint list. On the list he had received from the colliery there were names and no addresses; he had telephoned and been told that no other information was ever given. He could not ascertain all the addresses from that list. He had had no idea of attracting patients to himself; he already had more than he could deal with. He had not, to his knowledge, taken the patients of any other doctor. Relations between members of the profession in Horden had been strained ever since he had been there.

Cross-examined by Mr. Carthew, he said that Dr. Wilson had refused to discuss with him at all how he should notify the patients. It had never occurred to him that his agents might exceed his instructions and he had heard his patients say the method had been adopted before. In reply to the Legal Assessor, he said he had not consulted Dr. Wilson about the list as the partnership had by then been dissolved. In reply to Dr. Bone, he agreed that the colliery club patients were dependents of miners who were panel patients and whose addresses ought to have been found on the panel cards. The visitors had not brought back any panel cards. In reply to the President, he said that about 40 per cent. of the circulars sent out by the panel committee had been returned "not found in the village," owing to the frequent changes of address, and many patients had confessed to having received the circulars and not understood them.

Mr. E. Best, manager of the colliery, described Dr. Dixon's visit to him. The patients of Drs. Wilson and Dixon were all under the name of Dr. Wilson. Dr. Dixon had asked witnesses to let the workmen inform the office which doctor they wanted; witness had refused lest the colliery be accused of influence. A list of names without addresses had been furnished to Dr. Dixon. It was the custom to supply the doctors with names and addresses, but Dr. Dixon had been told that the work of searching for the addresses would take the office staff about a month. About 75 per cent. of the houses belonged to the company, which could move the people about so that large families had large houses, and they were being moved about all the time. If the doctors sent in their own lists the colliery would keep them up to date, but this partnership had not followed that practice. It was not the custom of the coalfields generally to supply addresses.

Mr. V. Williams, one of the visitors, testified that Dr. Dixon's instructions had been as Dr. Dixon had stated and that they had been expressly forbidden to use any influence or persuasion. He had visited between March 2nd and 6th only. He had been given an area to visit and had done nearly the whole of it, except that in a number of houses he had found no one at home. He had had nothing to do with panel cards and had never tried to persuade people to come to Dr. Dixon. He described his visit to the Tatters's, declaring that Mrs. Tatters's daughter had mentioned the panel cards and he had refused to have anything to do with them. He had not asked her if she would like to be on Dr. Dixon's panel. Cross-examined by Mr. Carthew, he said he had been a club collector for many years, paid by commission. He knew many people in Horden pretty well, but had not stopped to chat at the houses. He had carried out his work conscientiously and without bias. In reply to the Legal Assessor, he said he had not called at any house if he knew the inhabitants were patients of other doctors; those had been his instructions. He had given in his reports each night. He had not been paid for the work.

Re-examined, he explained that his commission was on private club patients only, not colliery club patients.

Mr. C. Knox, another visitor, gave similar evidence, as did Mr. R. Carruthers and Mr. F. Glaister, who said in cross-examination that they had acted without payment out of gratitude to Dr. Dixon.

Mrs. Mary Ann Finlay testified that Mr. Carruthers had called at Mr. Kaye's house but had seen only Mrs. Kaye. He had merely asked her with which of the two doctors she intended to continue.

Miss Katherine Tatters corroborated Mr. Williams's evidence, and said that Miss Wearmouth had asked her to sign a statement which was false in every respect, especially in that it said that Mr. Williams had offered to make it easy for her to change over to Dr. Dixon's panel.

Mr. Hempson summarised several more statutory declarations corroborating the earlier evidence. In addressing the Council, he admitted that Dr. Dixon had done a most unwise thing in sending collectors to all the houses in the district, but not a heinous thing, for they had only been told to inform partnership private patients of the dissolution and ask to which of the partners they wished to adhere. He put in statutory declarations to character and a petition signed by a large number of the inhabitants of the district.

After deliberation in camera the President announced that the facts had been proved to the satisfaction of the Council, but judgment had been postponed until May, 1935, when respondent would be required to attend and to produce evidence of his conduct in the interval.

### ALLEGED MISCONDUCT

*The Case of Mortimer McGhee Russell*, registered as of Sideways, Higher Green, Ewell, Surrey, M.B., B.Ch. 1916, M.D. 1920, U.Dub., who had been summoned to appear before the Council on the following charge:—

"(1) That being a registered medical practitioner you committed adultery with Violet Rosetta Smith, a married woman, who and whose family you had attended professionally, of which adultery you were found guilty by decrees of the Probate, Divorce and Admiralty Division (Divorce) of the High Court of Justice, both dated Jan. 29th, 1934, in the case of Russell *v.* Russell, in which you were the

respondent, and in the case of Smith *v.* Smith and Russell, in which you were the co-respondent. (2) That by reason of the said facts you abused your position as a registered medical practitioner. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

There was no complainant in this case.

Dr. Russell was accompanied by Mr. Herbert Malone, counsel, instructed by Messrs. Lawrance, Messer and Co., solicitors. Mr. Harper said that the facts under (1) were admitted, but (2) was denied on the ground that professional relationship had ceased in August, 1931, and the association leading to adultery had not started until May, 1933. He put in the decree and the shorthand notes from the Divorce Court, pointing out that Mrs. Russell had complained in 1931 and been assured there was nothing but friendship between respondent and Mrs. Smith, and that her husband had left her in 1932.

Mr. Malone set out the facts chronologically. Respondent had graduated in 1915, entered the R.A.M.C., and married in 1923. Almost from the beginning both Dr. and Mrs. Russell had realised that it was a very unfortunate mating. Mrs. Russell was so consumed with jealousy that neither man nor woman could be entertained socially in their house without a quarrel. Mrs. Smith had been a patient of the partnership and respondent had seen her three or four times a year. In November, 1930, she had had appendicitis and been operated on by Dr. Dainty, assisted by Dr. Russell. At that time she had been merely a rather troublesome patient. In 1931 she had been attended by Dr. Russell for miscarriage, July 6th–24th, and he had never attended her again. Respondent had gone to her husband, told him that Mrs. Smith was getting no benefit from his treatment as she would not obey him, and recommended another doctor, who had then taken over her case. She had disliked that doctor, and in October Dr. Dainty had communicated in the ordinary professional way with respondent saying that Mrs. Smith wished to become his patient, which she remained to this day. Respondent had tried to arrange a separation, but his wife had said "divorce or nothing." On his wife's suggestion in 1932 he had picked up a woman in order to give cause for divorce, and a petition had been filed in October, 1932, and come into the list in January, 1933, but before its hearing Dr. Russell decided to persuade his wife to try again. They had done so, but had again failed and separated. He had met Mrs. Smith by accident in December, 1933, not having seen her since July, 1931. She had then told him for the first time that she was unhappy and they had exchanged confidences. Some months later she had telephoned him and they had become friendly. He had made another unsuccessful attempt to become reconciled with his wife after that. Respondent proposed to marry Mrs. Smith as soon as the divorce decree was made absolute. He had not practised at all for 12 months.

Dr. Russell confirmed his counsel's account of the facts. Cross-examined, he admitted meeting Mrs. Smith and her husband casually in the street several times between 1931 and 1933. In 1932 Mrs. Russell had been complaining about everything under the sun, and had objected to his alleged intimacy with a dozen women, including Mrs. Smith. He had probably said there was nothing in it, but had not said there was friendship. In reply to the Legal Assessor, he said he had left Sutton in October, 1932, and Mrs. Smith had continued to live there. After that time he had not seen nor communicated with Mrs. Smith.

Dr. R. Dainty also confirmed the facts as set out by Mr. Malone. In October, 1931, Mrs. Smith had come to him asking if he would take her on as a patient and he had been attending her ever since. He had left Sutton in September, 1933, but she had continued to visit him. Counsel's description of Mrs. Russell had been quite an accurate one.

The President announced, after deliberation, that the facts alleged had not been proved to the satisfaction of the Council.

*(To be continued)*

## NOTES FROM INDIA

(FROM A CORRESPONDENT)

### BIOCHEMICAL TESTS IN CIRRHOSIS OF THE LIVER

A BIOCHEMICAL investigation of the blood in 53 patients admitted to the King George Hospital, Vizagapatam, South India, for cirrhosis of liver has recently been carried out by Dr. M. V. Radhakrishna Rao in the pathological department of the medical college to which the hospital is attached.[1] He found the fasting blood-sugar to be low in most of the cases of hepatic cirrhosis, the average being 78·24 mg. per cent., whereas the average fasting blood-sugar of normal Indians is 117·0 mg. per cent. He attributes the low blood-sugar to an impairment of the "glycogenetic and glycogenolytic functions" of the liver. No symptoms of hypoglycæmia, however, have been observed, even though in some cases the blood-sugar is less than 60·0 mg. per cent. The blood-urea in these cases was mostly within normal limits or rather higher, and only rarely fell to a low level; Dr. Rao takes this to indicate that the "ureogenetic function" of the liver is not usually deranged—even in advanced stages of hepatic cirrhosis. The non-protein nitrogen and the creatinine are also within normal limits or on the high side. The plasma cholesterol was low in most of the cases, but it is not certain whether this is due to the destruction of the hepatic parenchyma or to the diet of the patients, which was poor in cholesterol and fats.

### DR. RANGACHARI

The death occurred in Madras on April 24th of Dr. S. Rangachari. Dr. Rangachari, who was born in 1882, joined the Madras Medical Service in 1905 after a brilliant college career. He worked at various hospitals before he became a district medical and sanitary officer in 1914–15. He then became interested in obstetrics and gynæcology and was made assistant superintendent of the Government Maternity Hospital, Madras, in 1919, a post which he held in addition to that of surgeon of the General Hospital, Madras. In 1926 he retired from Government service and started a private nursing-home with well paid assistants and an adequate nursing staff in the Southern Presidency, where he did valuable work in the training of post-graduates who were allowed access to the patients in the capacity of assistants. Dr. Rangachari had exceptional surgical skill and clinical judgment, and his loss as a teacher will be widely felt.

### TYPES OF MENINGOCOCCI IN CALCUTTA EPIDEMICS

Dr. A. K. Sen and his collaborators in Calcutta have published (Jour. Indian Med. Assoc., March, 1934, p. 288) a preliminary report on the bacteriology of

[1] Jour. of the Ind. Med. Assoc., 1934, iii., 219.

the epidemic of cerebro-spinal fever which occurred in Calcutta at the end of last year. Altogether 42 different strains of meningococcus were isolated, of which 35 were typed by agglutination tests with the standard type sera. They found that during the period when these investigations were in progress the epidemic strains belonged mostly to type I., type III., or "type I. or III." of the Gordon-Murray types; not one of the 35 strains belonged to type II., type IV., or "type II. or IV." These results differ from those obtained by B. Sen in Calcutta in the epidemic of March and April, 1932; he incriminated mainly type IV., and found some strains of type II. It is possible that the virulent strains are different in different epidemics, but it is also noteworthy that the strains in 1932 were collected at the height of the epidemic, and that in 1933 they were collected when the epidemic had subsided.

### FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE

The ninth congress of this association will be held in Nanking, China, on Oct. 1st–7th, 1934. This association is an international organisation of medical, surgical, dental, and veterinary professional men interested in research and in the prevention of tropical diseases in the Far East. The seventh congress was held in Calcutta, and the eighth in 1930 in Bangkok. Among the vice-presidents of the congress are Major-General J. D. Graham, I.M.S., representing the Government of India; Lieut.-Colonel J. Morison, I.M.S. (Assam); Lieut.-Colonel A. D. Stewart, I.M.S. (Bengal); Lieut.-Colonel F. P. Mackie, I.M.S. (Bombay); Colonel C. A. Gill (Burma); Sir Frank Connor (Madras); and Lieut.-Col. H. H. Nutt (United Provinces), and official delegates from many parts of India are expected to attend the congress.

# OBITUARY

## MORGAN IGNATIUS FINUCANE, L.R.C.P., M.R.C.S.

WE regret to announce the death of Dr. Morgan Finucane, which occurred on May 31st at his country house, Seddlescombe, Sussex.

Morgan Ignatius Finucane was born in the Island of Ascension in 1865, the son of Dr. Daniel Finucane, an Inspector-General R.N. He was educated at the Royal Naval School, New Cross, and received his professional training at the medical schools of University College and St. Thomas's Hospital. He commenced practice in the Colonial Service, and was in succession medical officer to the Fiji Islands, medical superintendent of the Suva Hospital, and surgeon to the Victoria Hospital, Bathurst. In both colonies he acted as a stipendary magistrate, and in both, especially in Fiji, he studied the diseases of the country and their incidence upon the inhabitants, and published articles on yaws and elephantiasis from his personal observations. After 12 years with the Colonial Office he served in South Africa during the war, became civil surgeon to the R.A.M.C. at Aldershot and at the Tower of London, and also one of the medical officers to the Western Dispensary, Rochester-row. He was now appointed poor-law medical officer to the city of Westminster and did admirable work here as official, as doctor, and as philanthropist. He was for 27 years in charge of the workhouse and casualty wards, earning a high reputation for his keenness and sympathy, and becoming through his experiences with the unfortunate a reforming radical in politics.

He was called to the Bar at the Middle Temple and later acquired considerable practice as a consultant in medico-legal work. He was elected a member of the L.C.C., and served in several important capacities —e.g., as a member of the following committees, those of general purposes, children's care, and special schools. He was a manager of the old Metropolitan Asylums Board, and in 1914 was adopted as Liberal candidate for Westminster, but later joined the Labour party. He served on the Home Office Committee on delinquents and on the Lord Chancellor's Advisory Committee for the appointment of magistrates for the County of London, and has left his mark as an untiring worker both in social and political directions.

## FRANKLIN JOHN LIVINGSTONE, M.D. Toront.

Franklin John Livingstone was born in 1863 at Collingwood, Ontario, and graduated in medicine at Toronto. In 1895 he settled at Ladysmith as a medical practitioner, at the same time taking up missionary work for the Canadian Methodist Church. He was appointed district surgeon at Ingwavuma, Zululand, where he was in practice until the Boer war broke out. He was captured by the Boers, but made his escape, and for a time returned to Canada, where in 1901 he married Miss Sarah Gardiner, of Kingston, who returned with him immediately to Natal. He saw active service in the Zulu Rebellion of 1906, and was awarded the Queen's Medal. He now took up practice at Pomeroy, and, later, became district surgeon of Bulwer. In 1915 he returned to Ladysmith, and remained there for eight years, having a large native practice, and carrying on farming very successfully. In 1921 he took up his residence at Port Shepstone, where he died. Dr. Livingstone had been a noted athlete as a young man and was also a fine horseman and tennis player. He is survived by his wife, a son, and a daughter.

## DR. JAMES TAYLOR

LATE PROVOST OF KEITH

Dr. James Taylor, whose death was lately announced, was well known in many public capacities. He was born in New Deer, Aberdeen, in 1860, the son of Alexander Taylor, and was educated at the Grammar School and University of Aberdeen. He graduated as M.A. in 1880, and M.B., C.M. in 1883. He proceeded to the M.D. in 1887, and at the Aberdeen Royal Infirmary held the house appointments, becoming later clinical tutor in the medical school. On entering practice at Keith he filled many positions of local importance, was medical referee to the Home Office under the Workmen's Compensation Act, medical officer for the Post Office, medical superintendent of the Memorial Hospital, and examiner for recruits for the Army. With the rank of Major R.A.M.C. (T.F.) he did considerable local service during the war, was president of the Pensions Board at Keith, received the medal of the British Red Cross Society, and was made an honorary life member of the St. John Ambulance Association. He was J.P. for the county of Banffshire, acted as Sheriff's substitute, was provost of Keith from 1913 to 1919, and was a deputy lieutenant of the county.

CORBETT HOSPITAL.—On Saturday last Lord Cobham, the president, opened extensions of the hospital at Amblecote, Worcestershire, consisting of two new wings and a nurses' home, the first stage of a scheme for the provision of a new hospital. The cost of the whole scheme, including equipment, is estimated at £105,000.

# PUBLIC HEALTH

## The Drought

SPEAKING last week at Swindon, Sir Hilton Young described the measures which were being taken by the Government to relieve the situation caused by the drought. He was arranging for a standing conference of the three representative bodies—the British Waterworks Association, the Institute of Water Engineers, and the Water Companies Association—to act in coöperation with the Ministry, in order to bring to bear upon remedial measures all the available knowledge and experience of the experts and of those actually responsible for water-supplies. He had also appointed a special officer of the Ministry to promote the formation of regional water committees. Applications for grants under the emergency Act made it certain that the £1,000,000 would be promptly and usefully employed and would secure a real improvement in the rural areas most in need of it. The capital value of schemes already submitted exceeded £800,000.

## Mental Disease and Defect in London

At the end of 1932 there was provision in L.C.C. mental hospitals, under the Lunacy and Mental Treatment Acts, for 21,760 patients.[1] The demand for accommodation is increasing and schemes are in hand for meeting it, but it is not due to increased incidence of mental disorder (the tendency is in fact the other way) but to the accumulation of chronic patients who cannot be discharged. Only 177 of the 21,760 inmates were voluntary patients, but it is significant that at the Maudsley Hospital—which is now in its eleventh year of voluntary treatment of early cases—2070 out-patients were registered during the year, while 1109 were under treatment at the end of it. Of 672 in-patients discharged in 1932 from the Maudsley Hospital 88 are described as "recovered" and 331 as "relieved." Similar treatment is also available at three general hospitals under the public health committee. It may be expected that the number of voluntary cases will continue to increase.

Of mental defect 774 new cases were reported in 1929, 1796 in 1930, 2053 in 1931, and 1006 in 1932. This large increase, the peak of which has been passed, was more apparent than real, as it was largely due to the transfer of cases from poor-law authorities after the passing of the Local Government Act. For instance, 809 out of the 1006 reported in 1932 were in transferred mental institutions or in London mental hospitals. The increase thus represents the advance in ascertainment which unified control is gradually making possible. The total number of defectives at the end of 1932 ascertained by the L.C.C. to be dealt with under the Mental Deficiency Act represented a proportion of 3·65 per 1000 of population, less than half the proportion of defectives estimated in the Wood report. The discrepancy suggests that an undue proportion of defective children discharged from special schools are not yet being notified under the provisions of the Act. Of the 3272 defectives under statutory supervision 969 are employed, a fair proportion when it is remembered that those supervised must in the main be low-grade cases. There is little or no indication in the report of the nature of the training given at the various institutions, but that the possibilities of socialisation are not lost sight of is shown by the fact that at the end of the year 329 cases were on licence with a view to ultimate discharge, a proportion of 1 to 11 of the total number in institutions as compared with 1 to 9½ in 1931. Eleven per cent. however of the cases on licence in 1932 failed to make good.

[1] London County Council. Annual Report for 1932. Vol. VI. No. 3011. London: P. S. King and Son. 1s.

## More School Nurses

Addressing a conference of head teachers, Dr. R. H. Parry, medical officer of health for Bristol, advocated an increase in the number of school nurses. The usual plan now, except for a few specialised or residential areas, is for each nurse to have the care of a group of schools, sometimes a considerable distance apart. Dr. Parry would like to see a health nurse attached to every school and in close touch with the head teacher. The nurse is thus always on the spot ready to examine any child brought to her by the teacher; the child can then if necessary be sent home forthwith for the advice of the family doctor, or to the appropriate clinic or hospital. The nurse can decide whether or not to exclude a child from school, at least provisionally, in a way that is not possible for the teacher. Experience has shown that in certain matters the accuracy of the school nurse's opinion is remarkable; for instance, in a series of difficult ringworm cases J. Kerr found the nurse's errors to be a bare 3 per cent. In scabies her opinion is almost as good, and for the presence of nits it is practically infallible. In the exceptional schools with a nurse attached she often deals with minor accidents and ailments such as conjunctivitis, blepharitis, otorrhœa, and skin conditions. It is in conditions such as these that Dr. Parry finds home treatment so unsatisfactory. Even in the few instances where the parents seek the advice of their own doctor they seldom carry out instructions. For impetigo ointment is given with advice on the proper procedure, but the vital point, the removal of crusts, is overlooked with the result that an absence of 60 days may be due to this trivial cause. When such conditions are treated by a nurse the loss of school attendances is reduced to a few days. Another function which a whole-time nurse can perform is to see that children with orthopædic, cardiac, visual, and other disabilities are kept to the restrictions which medical authority has specified. Speaking to an audience of teachers, Dr. Parry naturally refrained from mentioning how much such supervision is needed; but the fact is that, although most teachers are helpful, there are still examples of myopes subjected to inappropriate conditions. The school nurse can maintain a high standard in the lavatories and washrooms; school meals and their conduct should not be outside her province. Dr. Parry regrets that a child is medically examined only three times in its school career, but he does not advocate more examinations "if the school nurses are increased in number and utilised to better purpose." If the nurse is to be of much use in observing the children and bringing forward all those who need further investigation she must have a more limited number of children under her charge. The gain from having a nurse to each school is so great that it is surprising that the practice is so unusual.

## Birth Control Advice at Clinics

In 1931 the Ministry of Health sanctioned the establishment by local maternity and child welfare authorities of clinics for women in need of medical advice and treatment for gynæcological conditions, where advice on contraceptive methods might be given to married women in whom pregnancy would be detrimental to health. The departmental committee, reporting in 1932, considered that advice and

instruction in contraceptive methods should be readily available for women suffering from organic disease such as tuberculosis, heart disease, diabetes, or chronic nephritis, in which childbearing is likely seriously to endanger life. It is admitted that there is nothing in law to prevent a local authority from rendering such a clinic available for women suffering from sickness other than gynæcological. In a circular (No. 1408) just issued the Ministry expresses agreement with the committee's view that contraceptive advice would be proper also for married women suffering from such forms of sickness, physical or mental, as are detrimental to them as mothers, if it is found medically that pregnancy would be detrimental to health. What is, or is not, medically detrimental to health is left to the professional judgment of the practitioner in charge of the clinic.

## INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 26TH, 1934

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 2 (last week 4); scarlet fever, 2308; diphtheria, 977; enteric fever, 19; acute pneumonia (primary or influenzal), 954; puerperal fever, 52; puerperal pyrexia, 119; cerebro-spinal fever, 24; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 5; dysentery, 4; ophthalmia neonatorum, 71. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 4th–5th was as follows: Small-pox, 5 under treatment, 0 under observation (last week 9 and 0 respectively); scarlet fever, 1568; diphtheria, 1689; measles, 2160 (last week 2363); whooping-cough, 293; puerperal fever, 31 mothers (plus 11 babies); encephalitis lethargica, 259; poliomyelitis, 2; "other diseases," 141. At St. Margaret's Hospital there were 15 babies (plus 5 mothers) with ophthalmia neonatorum.

*Deaths.*—In 121 great towns, including London, there was no death from small-pox or enteric fever, 52 (16) from measles, 11 (1) from scarlet fever, 29 (8) from whooping-cough, 41 (13) from diphtheria, 49 (9) from diarrhœa and enteritis under two years, and 32 (4) from influenza. The figures in parentheses are those for London itself.

Liverpool and Newcastle-on-Tyne each reported 5 fatal cases of measles, Acton and Gateshead 3, no other great town more than 2. Birmingham reported 3 deaths from whooping-cough; Merthyr Tydfil 3 deaths from diphtheria.

The number of stillbirths notified during the week was 248 (corresponding to a rate of 41 per 1000 total births), including 35 in London.

## THE BIRTHDAY HONOURS

THE list of honours conferred by the King on his 69th birthday contains the following names of members of the medical profession:—

### K.C.M.G.

Ambrose Thomas Stanton, C.M.G., M.D.
Chief medical adviser, Colonial Office.

### G.C.V.O.

Sir Milsom Rees, D.Sc., F.R.C.S.
Laryngologist, T.M. the King and Queen.

### K.C.V.O.

Maurice Alan Cassidy, C.B., M.D.
Physician extraordinary to H.M. The King.

### K.B.E.

Frederick Grant Banting, M.D., D.Sc.
Joint discoverer of insulin.

### Knights Bachelor

Major Robert George Archibald, C.M.G., D.S.O., M.D., R.A.M.C.
Director, Wellcome Tropical Research Laboratories, Sudan.

Rai Bahadur U. N. Brahmachari.
Medical practitioner, Bengal.

G. H. A. Comyns Berkeley, M.D., F.R.C.P., F.R.C.S., F.C.O.G.
Director, L.C.C. Radium Centre, Hampstead.

Major-General James Drummond Graham, C.B., C.I.E.
Late public health commissioner, Government of India.

Grafton Elliot Smith, M.D., F.R.C.P., F.R.S.
Professor of anatomy, University of London.

### C.B. (Military)

Major-General P. H. Henderson, D.S.O., M.B.
Director of hygiene, the War Office.

Major-General Ernest Alexander Walker, M.B., F.R.C.S., I.M.S.
Director of medical services, India.

### C.B. (Civil)

Rear-Admiral Percival Thomas Nicholls, M.R.C.S.

### C.I.E.

Lieut.-Colonel Harold Holmes King, M.B., B.S., I.M.S
Director, King Institute, Guindy, Madras.

Lieut.-Colonel John A. S. Phillips, L.R.C.P., L.R.C.S., D.P.H., I.M.S.
Director of public health, Bihar and Orissa.

### C.V.O.

Louis F. R. Knuthsen, O.B.E., M.D.

### C.B.E. (Military)

Group Captain Edward Cecil Clements, O.B.E., M.R.C.S.

### C.B.E. (Civil)

John Crosthwaite Bridge, F.R.C.S., D.P.H.
Senior medical inspector of factories, Home Office.

William Henry Peacock, M.B., B.Sc.
Deputy-director, health services, British Nigeria.

### O.B.E. (Military)

Colonel Walter Lister, T.D.
Late assistant director, medical services, West Riding.

### O.B.E.

Harry Edward Hewitt, M.D., B.S., D.P.H.
Second medical officer, G.P.O.

George MacLean, M.B.E., M.B., Ch.B.
Sleeping sickness officer, Tanganyika.

Miss Katherine Stewart Macphail, M.B.
Surgeon and superintendent, Children's Hospital, Belgrade.

Khan Bahadur K. Abdul Rahman, M.B., D.P.H.
Director of public health, Punjab.

### M.B.E. (Military)

Flight-Lieutenant Francis W. P. Dixon, M.B.

### M.B.E.

Joseph A. H. André, M.R.C.S., L.R.C.P.
Superintendent, Leper Asylum, Mauritius.

Yusuf Hajjar, M.D.
Medical officer, Government Hospital, Jerusalem.

Andrew Buchanan Macdonald, M.B., Ch.B.
Working at leprosy, Nigeria.

Major Frank Hermann Otto, I.M.S.
Assistant surgeon, Port Health Staff, Bombay.

Joseph L. D. Pawan, M.B., Ch.B.
Government bacteriologist, Trinidad.

Sowani Puamau.
First native medical practitioner, Gilbert and Ellice Islands Colony.

Geoffrey Osmund Schmidt, I.M.S.
Assistant surgeon, British Consulate, Kashgar.

### Kaisar-i-Hind Medal

Miss Doris Louisa Graham, M.B., B.Ch.
Medical missionary, Krishnagar, Bengal.

Miss Millicent Vere Webb, L.R.C.P.
Chief medical officer, Women's Medical Service for India.

# CORRESPONDENCE

## OLIGURIA AND ŒDEMA

*To the Editor of* THE LANCET

SIR,—During the last ten or twenty years there has been an increasing tendency to minimise the rôle of the kidney in the causation of œdema. The term "extrarenal" has been forced more and more into prominence, and the decreased colloid osmotic pressure of the blood caused by diminished plasma protein content has become the current explanation of the œdema of Bright's disease.

This explanation, for which Epstein is largely responsible, is an unsatisfactory one for several reasons, the two main ones being that it cannot account for the œdema of acute nephritis (for the plasma proteins are not diminished at that stage), and that variations in plasma protein do not precede, or correspond with, variations in the amount of the œdema or the amount of urine secreted. (McClure and others.[1]) It must be admitted that in long-standing cases of pronounced œdema in renal disease (subacute nephritis and nephrosis) the total plasma protein is almost always found to be below 5 per cent., and in my opinion there is little or no doubt that the diminished oncotic pressure will *favour* and *increase* the occurrence of œdema and oliguria. But as it is manifestly absurd to say that the œdema of acute nephritis and that of subacute nephritis are caused by two totally different mechanisms, it is necessary to look for some factors common to both conditions.

In your issue of May 26th Prof. Shaw Dunn suggests that the modern theory of renal secretion (Cushny) can be made to explain the œdema of renal disease, and that the oliguria is most probably dependent upon excessive reabsorption in the tubules from a glomerular filtrate which originally may be normal in amount. This would account for the fact that water and chlorides are retained while urea is excreted. I fully agree with this view, but arrived at it through a totally different process of reasoning[2] from a consideration of the important work of Verney[3] and Winton,[4] which Prof. Shaw Dunn does not appear to have taken into consideration. These workers, following up the experiments of Rose Bradford, have formulated the law that *the composition of the urine depends upon the rate of its secretion*. If the arterial pressure is lowered or the venous or ureteric pressure increased, the filtration pressure in the capsule is reduced, with the result that the urine is secreted more slowly, there is more opportunity for reabsorption in the tubules, and the resulting urine is concentrated and of relatively high specific gravity. If in a pair of kidneys the arterial pressure of one is reduced, and the venous or ureteric pressure of the other is increased, to such an extent that the rate of secretion of urine in both kidneys is equal, the composition of the two urines is the same (as regards chloride and urea content) though proteinuria usually occurs if the venous pressure is raised. Verney also refers to the reserve forces of the kidney, the first line of defence being the *structural reserve*, all the available nephrons being called into action at the same time; the second line being the *functional reserve*, when the intra-glomerular pressure is raised (usually with a coincident rise of blood pressure) the rate of secretion is increased and the composition of the urine becomes correspondingly dilute. This latter response is what happens in chronic nephritis and all varieties of renal failure, characterised as they are by polyuria and low specific gravity.

Verney and Winton's work can thus be used to explain the type of urinary secretion existing in all kinds of renal disease, by changes in glomerular pressure, and it must be admitted that such changes in pressure are at any rate probable, if unproved. In acute nephritis, for example, the glomerular obstruction leads to slow secretion, increased reabsorption, oliguria, increased specific gravity, and œdema. Nitrogen-retention is prevented by the structural reserve except in the most severe cases. In subacute nephritis the same conditions may exist, and, in addition, the extrarenal factor of plasma protein loss will increase the œdema at this stage. In nephrosis glomerular obstruction being absent and ureteric pressure presumably unaffected, it is tempting to fall back on increased venous pressure as a possible cause of the slow secretion and consequent oliguria. This would at the same time account for the albuminuria. The extremely important evidence now added by Prof. Shaw Dunn, that the glomerular vessels in nephrosis are abnormally patent, is further proof here of the calling-out of the structural reserve, and is surely compatible with, if not even confirmatory evidence of, increased venous pressure. On the other hand, the swelling of the tubules might have an effect equivalent to raising the ureteric pressure. Subacute nephritis and nephrosis probably overlap in all their functional pathology, the one being merely the extreme form of the other. Plasmaprotein loss will be a factor in each.

In chronic nephritis, where œdema has disappeared or has been absent from the start, the functional reserve is eventually called out, the glomerular pressure rises, the urinary secretion becomes rapid, and the specific gravity falls. But this stage would not be reached until the structural reserve was used up and many nephrons were out of action. Therefore nitrogen-retention will eventually occur. A further proof that Verney's law still holds good, and that the specific gravity of the urine is now low merely because the secretion-rate is high, is seen sometimes at the end of chronic nephritis (or more often of nephro-sclerosis). Heart failure occurs, *the blood pressure falls*, the high glomerular pressure fails, the secretion of urine becomes less, *the specific gravity rises*, and œdema (of cardiac type) appears. The damaged kidney, able, perhaps, still to eliminate by the aid of its functional reserve now becomes totally inadequate and uræmia overtakes the patient before heart failure has run its full course.

Assuming then that the kidney in disease continues as far as possible to obey Verney's law of secretion, one may go so far as to say that if in nephritis, oliguria and high specific gravity exist when not required to do so by the needs of the body, then a pathological reduction of filtration pressure in the glomerulus may be assumed to have occurred, and reabsorption of fluid in excess of the body's requirements will of necessity take place. As an illustration of the possible events, the following purely hypothetical figures may be given:—

1. Normal kidney; 2/3 of total nephrons active; 50 litres of glomerular filtrate; 48½ reabsorbed = 1500 c.cm. urine.

2. Acute and subacute nephritis, and nephrosis; *all* nephrons active; still only 50 litres of filtrate (owing to reduced glomerular pressure); 49½ reabsorbed (owing to slow secretion) = 500 c.cm. (concentrated) urine. Non- or low-threshold substances would be excreted

[1] McClure, W. B., de Takáts, C. B., and Hinman, W. F.: Arch. Int. Med., 1933, li., 819.
[2] Platt, R.: Nephritis and Allied Diseases, London, 1934.
[3] Verney, E. B.: THE LANCET, 1929, i., 539; 1930, ii., 63.
[4] Winton, F. R.: Jour. of Physiol., 1931, lxxi., 381; 1931, lxxii., 49 and 361.

as before because the amount of filtrate is the same, but a litre of saline solution is retained.

3. Chronic nephritis, nephro-sclerosis, &c.; only half of total nephrons left; 50 litres of filtrate still produced (by high pressure, rapid secretion); only 47½ reabsorbed = 2500 c.cm. dilute urine. Still no nitrogen retention, but polyuria and thirst present.

4. Advanced chronic nephritis, &c.; only quarter of total nephrons left; 30 litres of filtrate produced; 28 reabsorbed = 2000 c.cm. dilute urine. Nitrogen-retention now present owing to reduction of total filtrate, despite polyuria.

5. Superadded heart failure. A quarter of total nephrons now only produce 15 litres of filtrate (owing to fall in pressure); 14¾ are reabsorbed = 250 c.cm. of *concentrated* urine. Uræmia rapidly terminates the illness.

Certain other facts can be considered with interest in relation to these hypotheses. For instance, the old theory that the kidney of chronic nephritis has *lost* the power to concentrate is disproved by observation of the specific gravity in a terminal case with heart failure. The question also arises: is the œdema of heart failure itself (without significant renal disease) not due to the slow renal circulation and relatively high venous pressure in the kidney, instead of to a high pressure in the general venous circulation as ordinarily accepted? The difference in distribution of renal and cardiac œdemas has always been looked upon as proof of their different origin, but would it not be fair to suppose that if renal œdema occurred in a patient with an already high general venous pressure, retained fluid would accumulate in the dependent parts where that pressure was highest? Even in long-standing cases of renal œdema the distribution comes eventually to be almost entirely in the dependent parts, and only in acute nephritis, where fluid rapidly accumulates, is the distribution practically independent of the laws of gravity. Thus the general increase of venous and capillary pressure in heart failure may come to be looked upon as a secondary factor in the production of œdema, just as in nephrosis the low plasma protein content is a secondary factor, the primary and important factor in each case being the increased reabsorption of fluid in the renal tubules owing to the slow rate of glomerular filtration.

On any theory it is difficult at present to explain the absence of œdema in most recorded cases of total anuria (latent uræmia). Even when anuria occurs in the course of acute nephritis it is not necessarily in the most œdematous cases. But here a distinction may possibly have to be drawn between fluid which has been reabsorbed in excess and fluid which has in effect never reached the kidney at all. In the first place the kidney has done its work, though badly, and the fluid returned to the blood stream appears to be stored up in the tissues. In the second the fluid appears to be retained in the blood as if seeking elimination. The fact that in total anuria *all* the electrolytes are retained may also be a factor of importance.

Prof. Shaw Dunn's demonstration of the extraordinary extent to which a small loss of albumin in the glomeruli may become concentrated on its way through the tubules again upholds the possibility of vascular changes in the glomerulus, either "stasis with slight dilatation" as he supposes, or increased venous pressure, which amounts to practically the same thing and has been shown experimentally to produce albuminuria. That the albuminuria is more likely to depend on such changes than upon the prolonged action of toxins or changes in the nature of the plasma protein is suggested by the extreme rapidity with which it may clear up in certain cases. Kerridge's [5] work, on the nature of proteinuria in nephritis, if confirmed in cases of nephrosis, will finally dispose of the theory that the plasma albumin has undergone some change which renders it foreign to the organism and is being excreted.

As Prof. Shaw Dunn truly says, "it is obviously impossible at the present time to submit completely verified facts in support of every contention," but if reasoned argument on the basis of the accepted theories of renal secretion drives one to the conclusion that in certain pathological states œdema would be expected to occur, and if one finds on clinical examination that these are the precise states in which œdema does occur, it is a welcome relief to discard such vague phrases as "metabolic disturbances" and "increased vascular permeability," neither of which conditions are known to exist in renal disease, or are capable of demonstration at the present time.

I am, Sir, yours faithfully,

Sheffield, May 30th. ROBERT PLATT.

[5] Kerridge, P. M. T.: THE LANCET, 1934, i., 675.

## ACUTE HÆMOLYTIC ANÆMIA

*To the Editor of* THE LANCET

SIR,—The case of the boy, aged 2½ years, described by Dr. H. A. Dunlop and Dr. A. G. Sanders in your last issue (p. 1169) was almost exactly similar to that of the boy, aged 3 years, which I brought before the Royal Society of Medicine on Jan. 22nd, 1932 (*Proceedings*, vol. xxv, p. 715), under the heading, Severe Acute Hæmoglobinuria in a Boy. The hæmoglobinuria in the latter case was accompanied by fever and an acute hæmolytic type of anæmia with leucocytosis. Rapid recovery followed a blood transfusion of 200 c.cm. The erythrocyte count on Nov. 27th, 1931, just before the blood transfusion, was 1,320,000, and 14 days later (Dec. 11th) it was 4,500,000. I suggested that, as no toxic or other cause for the hæmoglobinuria had been discovered, the case might represent an extreme form of "acute hæmolytic anæmia," as described by Max Lederer in 1925 and 1930.

A more characteristic example of acute hæmolytic anæmia was the case of a boy, aged 11 years, that I brought before the Royal Society of Medicine on Oct. 9th, 1931 (*Proceedings*, vol. xxv., p. 15). The erythrocyte count, which on May 1st, 1931, was 780,000, reached 6,400,000 by August 19th. I headed my description: An Anæmic Breakdown or Crisis in a Child, not connected with definite Congenital Hæmolytic Jaundice. At that time I knew of only a single case in medical literature that resembled it, but soon afterwards I found that it was a typical example of the type of anæmia described by Lederer in America, Christiansen (Copenhagen, 1929), and Fiessinger and his colleagues (Paris, May, 1931). Later on I heard of the cases of Prof. L. Parsons and his colleagues at the Children's Hospital, Birmingham.

Both my patients have remained free from another attack. It is worth noting that the colour-index was at first 1·22 in my first case, and in my second (the hæmoglobinuric) one it likewise reached 1·2 at one blood count (not recorded in my printed description).

I am, Sir, yours faithfully,

London, W., June 4th. F. PARKES WEBER.

## TREATMENT OF RODENT ULCER BY FREEZING

*To the Editor of* THE LANCET

SIR,—I should like to compliment Dr. Semon on his admirable paper dealing with the use of carbon-dioxide freezing in dermatological practice, and I would specially endorse his statement that where firm pressure can be exercised with the snow pencil "freezing will give results as good as radium" in

early rodent ulcer. I have used this method consistently for many years and have a large volume of evidence in support of that opinion. I would, however, deprecate Dr. Semon's statement that "a minimum exposure for a rodent ulcer is one minute." I am quite sure this is unnecessarily long in many cases of the more superficial type, and my own practice is always to begin with exposures of half that period. I think also that sepsis is so rare as a result of freezing that it can be practically ignored. The explanation for this fact I cannot give, but the "vital reaction" (whatever that may mean) which Dr. Semon offers as an explanation is at any rate a convenient hypothesis.

Personally, I am reluctant to use freezing in positions overlying cartilage and I should never use it in any circumstances upon the eyelid over the eyeball. The acetone mixture I have found useful in certain cases of lupus erythematosus, where the degree of freezing desired is relatively slight, and the advantage of a liquid application which can follow outlines is obvious.

The fact that in certain types of rodent-infiltration spontaneous recovery may take place, as has been demonstrated quite definitely in certain cases—for example, of the type which I have ventured to call "erythematoid benign epithelioma"—suggests, I submit, that the malignity of rodent lesions has been considerably over-estimated, both by patients and by doctors. In the flat early patches the mischief is very superficial, and superficial treatments are usually entirely adequate. Indeed I have had cases in which these superficial types have not improved under X ray or radium treatment, but have responded most satisfactorily to freezing.

I am, Sir, yours faithfully,

E. GRAHAM-LITTLE,
Physician in charge of the Skin Department, St. Mary's Hospital.

Wimpole-street, W., June 4th.

## CEREBRAL HÆMORRHAGE AND BLOOD PRESSURE

*To the Editor of* THE LANCET

SIR,—There is a widespread belief that arterial pressures maintained at systolic levels of 200 mm. of mercury or more, with corresponding diastolic levels of 120 mm. or more, are of grave prognostic import because it is thought that the risk of cerebral hæmorrhage is thereby greatly increased. While agreeing that cerebral hæmorrhage is possible at such high levels, my own experience during the past 20 years shows that the majority of cases occurring at ages above 40 years that I have seen in consultation have run systolic arterial pressures well below 200 mm., ranging for the most part from 190 to 145 mm. No inference can be drawn about the incidence of cerebral hæmorrhage from the presence of generalised arterio-sclerosis, for post-mortem observations have repeatedly demonstrated that the state of the superficial arteries bears no relation to the state of the cerebral arteries. At the base of the brain arterial circulation is carried on through small vessels of varying calibre. These are prone to local degeneration of the intima, and in them miliary aneurysms are frequent. In generalised arterio-sclerosis the march of events is more or less gradual, in most instances sufficient time elapsing for processes of repair to preponderate over those of degeneration. Of the total number of cases of arterio-sclerosis, less than half are associated with persistently raised arterial pressures, the sclerotic process representing a reaction to damage of the vessel walls induced by various factors, the chief of which are probably endogenous or exogenous toxins.

By the time that pressures of over 200 mm. have been reached, the walls of the larger vessels have usually become capable of withstanding grades of pressure far higher than would cause cerebral hæmorrhage in small arteries locally degenerated, and the subjects of extremely high pressures not infrequently manifest capacity for full work over a period of years. On the other hand, when arterioles surrounded by soft and yielding brain substance degenerate, they tend to burst at the weakest points under pressures which may be relatively moderate. High diastolic pressures are of importance in this connexion through production of continuous strain, systolic pressures constituting an additional fluctuating load which may become of sufficient magnitude to cause a cerebral artery weakened by disease to give way.

I am, Sir, yours faithfully,

Harley-street, May 30th. J. F. HALLS DALLY.

# PARLIAMENTARY INTELLIGENCE

## NOTES ON CURRENT TOPICS

### School Medical Services

ON May 30th, in Committee of Supply on the Civil Estimates for 1934, Mr. RAMSBOTHAM (Parliamentary Secretary to the Board of Education) said he was well aware that there was an impression in many quarters that the physical condition of the children was deteriorating in consequence of prolonged economic distress.

#### NUTRITION IN DEPRESSED AREAS

The reports which he had received from up and down the country certainly did not confirm it.

According to the report of the school medical officer for the North Riding of Yorkshire, dated February, 1934—an area which had suffered a great deal from industrial distress—out of 13,000 children medically examined only seven were really bad cases, and the children pronounced subnormally nourished declined from 6·54 per 1000 in 1930 to 3·97 in 1933. The school medical officer wrote: "Malnutrition, the sequence of absolute lack of food, was not established. On the other hand, and as so often reported, the real cause appeared to be improper feeding; there was a sufficiency of food of a kind, but of the wrong type; there is also the malnourished child from the home of the well-to-do, a condition often associated with physical ill-health."

The school medical officer for Thornaby and Eston wrote: "There has been great depression throughout my area. About 50 per cent. of the men are unemployed, but an amazingly high standard of nutrition is maintained. The few that are under-fed do not suffer from lack of quantity but of quality of food, and this is not because of poverty."

#### CAUSES OF MALNUTRITION

He was not, Mr. Ramsbotham said, quoting that area as typical of the whole country; it clearly was not the case that the percentage of malnutrition was low in the country as a whole. He quoted it for this reason. It was apparently not generally realised that malnutrition might, and obviously did, occur in certain cases not on account of poverty but on account of unsuitable feeding or organic defects and delicacy. For example, from a recent investigation it was found to be comparatively rare for the brothers and sisters of a malnourished child to show any signs of malnourishment. As regarded the country as a whole, the figures of malnutrition showed little change from last year.

In 1931 the number per 1000 was 11·2, in 1932 it was 10·7, and in 1933 it was 11·1. There was just over 1 per cent. of the children coming within that category, and it would certainly be unreasonable to draw any inference from the fractional increase in 1933 as compared with 1932,

but, nevertheless, 10 per 1000 were too many. Increasing and energetic steps were being taken to combat this evil.

PROVISION OF MEALS

The principal factor in the fight to check malnutrition as far as the Board of Education were concerned was obviously the provision of meals by local educational authorities. This year 190 out of 316 authorities had exercised the powers under the school feeding sections of the Education Act, and it was expected that ten more were shortly to adopt those powers. Those authorities covered about 70 per cent. of the school population of England and Wales, and as they were almost entirely authorities in industrial areas, somewhere between 90 and 100 per cent. of the children in industrial areas were covered by authorities which exercised those powers.

The others were mainly in rural areas or in seaside or small country towns where the experience of the Board went to show that the problem of malnutrition was of small or negligible proportions. The Board had not allowed the financial stringency of the time to impede the desires of local authorities to spend money on the provision of meals on which they paid the grant at the rate of 50 per cent. In 1928 the net expenditure of the authorities on this service was £227,000; last year it was £560,000. In 1928 the number of authorities exercising their powers in this matter was 145; last year it was 190; and this number was to be increased by about ten more. In February of this year the authorities were feeding about 292,000 children either with ordinary meals or milk, and about 212,000 of these were being fed free of charge, so that although only 1 per cent. of the public elementary school-children were reported to be suffering definitely from malnutrition, free meals and milk were being provided for over 4 per cent.

In addition, there were about 900,000 children receiving one-third of a pint of milk daily for the payment of one penny under voluntary schemes organised by the National Milk Publicity Council.

SELECTIVE FEEDING

It had been represented to him that all local educational authorities should be urged to provide free dinners for the children of the poorer classes. In view of the large expense involved, that course could not be justified unless it was clearly established that the existing permissive arrangements were inadequate. He did not think that that was the case. The principle was that the expenditure on the provision of meals out of educational funds should be related to the educational capacity of the children, and should be based on a selection by school medical officers of the children, supplemented by reports from their teachers.

Such selection should include not only children definitely malnourished, but children who also showed any symptoms of subnormal nutrition. To make the provision of meals universal for all poor children would contradict that principle, and impose on local education authorities the duty of supplementing out of educational funds the assistance given from other sources for the relief of economic distress. In any event, the experience of some of the most distressed areas showed that it was possible to keep malnutrition in check by providing dinners, or even milk only, under a system of medical selection, which would include all children suffering from subnormal nutrition, but not those children who, though poor, were able to take advantage of the education offered to them.

NO EMBARGO ON NEW SERVICES

He had seen from time to time in the educational press suggestions that the Board was placing an embargo on various services for improving the physical condition of the children. No such embargo had or was being placed on the school medical service. Last year they approved 17 proposals for new clinics, and 124 forms of inspection and treatment, including the appointment of additional medical officers, dentists or specialists, school nurses, the equipment of clinics, and many other forms of expenditure, and this year they had allowed in the Estimates for an increase in the cost of the school medical service.

CRITICISM OF THE BOARD

Mr. COVE said that many black-listed schools still existed throughout the country. Teachers were supposed to teach the children cleanliness and hygiene when the physical conditions in the school were filthy in the extreme. He begged the Parliamentary Secretary not to be content with the reports sent him about the physical condition of the children, but to make investigation which would reassure the country that the children were not being ill-fed. He quoted the recent investigation in Newcastle (see THE LANCET, May 12th, p. 1029) into the physical condition of children from 2–5 years, which showed that nearly half the children in the poorer class were below the standard height compared with only 5 per cent. among the better-class children; and that 49 of the 125 poorer children had suffered from chest trouble, compared with 5 of the 124 better-class children. This investigation, he claimed, showed that there was tremendous need for better attention to the physical needs and general well-being of young children.

Dr. G. MORRISON said he understood that some education authorities were willing to lend the services of their medical officers for the junior instruction centres. He was glad to hear that the Board was not likely to be niggardly in the matter, but would look with an indulgent eye on schemes for providing medical services for those who were not insured under the National Health Insurance scheme.

Viscountess ASTOR said children between two and five years of age should be the special concern of the country. There was a gap between those ages in the medical care and treatment of young children. Splendid progress in infant welfare work had been made, but the children from two to five years of age in overcrowded areas were being neglected, although one knew the remedies. In 1931 progress was being made in the establishment of nursery schools, but it was stopped by the Economy Act. There were 5000 children in the open-air nursery schools, while 174,000 children between two and four years of age were living under slum conditions. She urged the Government to restore the cuts imposed on nursery schools, which were a vital necessity.

Mr. RAMSBOTHAM said that within the last month or two the Board had authorised two more nursery schools, and there was nothing to prevent local authorities submitting fresh proposals.

## Hospitals and Prize Competitions

In the House of Lords on May 31st Lord LUKE moved to insert the following new subsection in the Betting and Lotteries Bill:—

Notwithstanding anything contained in this section a corporate body established before the passing of this Act for a charitable purpose may conduct for any such purpose any competition in which success depends partly upon the exercise of skill (other than a competition such as is referred to in paragraph (a) of subsection (1) of this section) in respect of which such corporate body shall have submitted to the chief officer of police of the area in which their principal office is situate a copy of the rules and conditions of the competition together with the opinion of counsel that success in the competition depends to a substantial degree upon the exercise of skill and the chief officer of police shall not within fourteen days after such submission have intimated his disagreement with such opinion.

They were very anxious, he said, to preserve for the hospitals this potent source of revenue which seemed to be threatened under the provisions of the clause. The ambiguous word was "substantial" as introduced in defining the amount of skill required to keep a competition within the law, and the amendment provided for a decision as to the legality of competitions run by charitable bodies before the charity concerned had incurred the expense of launching the competition. It was very undesirable that voluntary workers endeavouring to raise funds for a charity should be open to prosecution and penalties when they were acting in accordance with the best legal advice obtainable. It was equally undesirable that the charity for which they were acting should incur the risk of losing several thousands of pounds which might have been spent in printing and advertising. Unless the amendment, or some other

provision on similar lines, was embodied in the Bill, it would mean that charitable bodies must either face the above risks or forego an important source of revenue.

The British Charities Association, said Lord Luke, had run competitions for 10 years. Last year they distributed £21,000 to the hospitals, which brought their total distribution to over 900 hospitals up and down the country to about £250,000. Their competitions had usually been part skill and part chance, but not one of them had ever been challenged in the Courts. It would be impossible to run a competition entirely dependent on skill if they were going to allot prizes, because they could not define skill down to, say, one-hundredth-thousandth part, and that would be necessary when they had over 100,000 competitors. There was bound to be a considerable element of chance, but the competitor usually thought that his skill was a more important factor than it really was, and if it was the moral aspect that the Bill was dealing with, that was important. Prize competitions for charity were both popular and harmless, and charities could ill-afford at the present moment to be deprived of this source of income. The position of a hospital, or other charitable body, running a competition after the passing of the Bill, if it was unamended, would be that it would run the risk of an action to show whether the skill element was substantial or not. If the competition had started, this action might come at a critical time and cause loss to the organisation whether the skill was proved to be substantial or not. As the charity depended on the public sending in *6d.* or *1s.* entrance money, the mere talk of litigation would spoil the chance of success. Another point was that the views of magistrates might differ very much as to what was a "substantial" amount of skill, possibly due to their holding varying views as to the morality even of a competition.

Charitable bodies, Lord Luke concluded, could not take the risk of a gamble as to whom their case would be tried before, especially when there was no yardstick by which they could gauge the amount of skill required. The amendment sought to settle the matter before the charity started operations.

#### GOVERNMENT REPLY

The Marquess of LONDONDERRY said that the amendment was designed to provide machinery to enable the legality of these competitions promoted by charitable bodies to be determined in advance. One could sympathise with the desire that the British Charities Association should be allowed to promote competitions without the risk of legal proceedings, but the question whether any particular competition was or was not legal could be decided only by the Courts.

## Milk and Public Health

On May 31st the House of Commons went into Committee on the money resolution in connexion with the Milk Bill.

#### STATEMENT BY THE MINISTER OF AGRICULTURE

Mr. ELLIOT said that the objects which the Government sought to achieve were a bigger consumption of milk and the cleaning up of the herds. The short-range policy consisted of emergency advances for putting a bottom into the market for manufactured milk, and the long-range policy was the cleaning up of the herds and, based upon that, a campaign of publicity and, if possible, of cheapness for increasing the consumption of milk and thereby dealing with the present glut. The committee of the Economic Advisory Council rightly stated in their recent report that the total eradication of bovine tuberculosis from all herds was the only complete solution of the problem of tuberculous milk. This solution could not be reached for many years, and without considerable expenditure, but, as at present advised, the Government proposed to use £750,000 primarily for making a start. He agreed with Dr. John Orr that the present position of the dairy cows was a reproach both to the Department of Health and to the Department of Agriculture. If the country had paid half the attention to the improvement of the milk-supply that it had paid to many far less urgent and important questions, this reproach would not lie at our door to-day compared with other countries. The resolution also authorised a contribution of £1,000,000 from the Exchequer on a £-for-£ basis for two years in order to increase the demand for milk. The Milk Marketing Boards would contribute the other pound. Programmes submitted by the Boards would not be approved unless they contained provision for the supply of milk to schools at reduced rates.

Mr. T. WILLIAMS said the Opposition agreed that the country ought to set to work to clean up its herds and to provide a pure milk-supply, but if millions were to be hurled away he thought they should be spent in providing the children with free milk. The Government started at the wrong end. They would not clean up the herds so long as they left the task in the hands of county councils run by farmers and landowners. A nationally organised service was required.

Mr. DE ROTHSCHILD felt grave apprehension lest the adoption of pasteurised milk should retard progress towards a pure natural milk-supply. The present conflict in medical opinion on pasteurisation might be very sincere, but it was worrying the milk-consuming public. He suggested that part of the money voted should be given to experiments in schools which would conclusively show the relative values of raw, pasteurised, and T.T. milk.

#### SCHOOL-CHILDREN AND SURPLUS MILK

Sir E. GREGG said he believed the supply of milk to school-children could be made to consume something like 300,000 gallons a day, or 9,000,000 gallons a month, which would account for the greater part of the Marketing Board's surplus: and if, in addition, milk was given to infants not yet of school age and to nursing mothers the whole of the surplus could be used very effectively indeed. He suggested the establishment of something in the nature of a new children's health insurance fund to which contributions should be paid by the milk industry and by the parents and made up as far as was necessary by the Government. A measure of that kind, while of the greatest value to the children, would remove discrimination between those whose parents could afford to pay and those who could not.

Sir F. ACLAND was afraid that if the proposal of distributing milk to schools was rushed some medical officer would say that a child had acquired tuberculosis through drinking milk. That would do away with all the good of the publicity campaign. He would much rather put the scheme off for a year or two until they could be certain of an adequate supply of really tubercle-free milk.

Mr. SKELTON (Under-Secretary of State for Scotland): Does the right hon. gentleman apply the same principle to the supply of milk to children in their own homes?

Sir F. ACLAND said he did not. He thought a great deal more good was done by getting more milk drunk than by saying that nobody should ever drink milk which had not been approved by all the medical authorities in the country. He thought many medical officers of health overdid their pursuit of pasteurisation and so on.

Captain HEILGERS, speaking as a producer of Grade "A" milk, said he thought doctors had done a tremendous amount to kill the production of clean milk in this country. By crabbing the milk-supply day in and day out the medical profession had made it most difficult to enable the Milk Marketing Board to raise the sales of liquid milk in this country. By plumping for pasteurisation, and imperfect pasteurisation such as existed to-day, medical men had played into the hands of the milk distributors. He agreed that a pre-pasteurisation standard was needed, but farmers could not be forced to produce cleaner milk unless they got a proper reward. It would be a great thing to clear tuberculosis from the country, but he felt that medical men had not given milk producers a fair deal as regarded the dangers which they had represented as arising from tuberculosis. The odds were 2200 to 1 in any year against any child getting tuberculosis, and the mortality-rate for measles, whooping-cough, diphtheria, and other diseases was much greater.

MILK-BORNE DISEASE

Sir F. FREMANTLE said no one who knew anything about this subject would wish to intensify the fears of people in regard to infection from milk; on the other hand, those who tried to belittle the amount of disease which might arise were doing the worst possible injury to the dairy industry.

The milk commission of the People's League of Health had pointed out that at least 40 per cent. of the cows in this country are infected with tuberculosis, and that at least one in every 100 cows is actively discharging tubercle bacilli into the milk or elsewhere. According to the commission anything from 5 to 13 per cent. of the milk sold for human food contains living, virulent tubercle bacilli, while on the human side about 2000 deaths in England and Wales, mostly in children, occur annually from infections with the bovine bacillus . . . with not less than 4000 fresh cases each year.

It was absurd to say that the medical profession ought not to pay any attention to the comparatively small amount of tuberculous milk; it was no use saying that the risk ought to be taken. But there were certain devices which were perfectly possible. The problem of pasteurisation, indeed, seemed to be solving itself, since about 95 per cent. of the milk which came into London for consumption was pasteurised. At the same time, the proper use of these methods required a good deal of intelligence and ingenuity. If milk was provided for schools it would be done under the authority of either the school medical officer or of the medical officer of health, who would have to consider how it should be rendered safe. He believed that the greater number of them would say that it was possible to pasteurise milk cheaply, and that in any case the nutritive value of the milk would be infinitely to the advantage of the children, and they would desire to give them as large a supply as could be allotted. In improving present conditions the short-term policy was represented by measures such as the pasteurisation or boiling of milk. The long-term policy was that of the eradication of tubercle from the herds. It would be a mistake to suppose either that this was an impossible task, or that it could be done in a year or two. It would be very difficult, but he believed it could be achieved.

After further debate the resolution was agreed to by 177 to 43.

### Price of Insulin

In the House of Commons on June 4th, on a Finance Bill amendment to place insulin on the free list, Mr. Herbert Williams appealed to the Chancellor not to remit the duty of 33⅓ per cent., because it assured home supplies if for any reason supplies from abroad should be cut off, and it afforded protection against a possible monopoly by a foreign firm. Mr. Chamberlain replied that the imposition of the duty was in fact an accident. It had followed the success of a contention not to obtain a duty upon insulin but to obtain a proper definition of dutiable fine chemicals. The manufacturers of insulin had certainly not exploited the public, but he had become aware of a feeling among diabetics that they were paying more than if there had been no duty. To them insulin was a matter of life and death, and he was unwilling to leave them with the shadow of a grievance. If injury resulted British manufacturers could still apply to the advisory committee for a new duty.

## HOUSE OF COMMONS

THURSDAY, MAY 31ST

### Animals Slaughtered under Tuberculosis Order

Captain HEILGERS asked the Minister of Agriculture the amount paid in compensation for animals slaughtered under the Tuberculosis Order of 1925 for the year 1933.—Mr. ELLIOT replied: The total sum paid in compensation for animals slaughtered under the Order in 1933 was £71,827.

### Purity of Water in Swimming Baths

Mr. D. G. SOMERVILLE asked the Minister of Health whether he would consider the desirability of suggesting to all local authorities possessed of swimming baths the necessity of insisting upon a rigid standard of purity of the water.—Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: A report on the purification of water in swimming baths was prepared by the Ministry in 1929. The report emphasised the importance of clean water in public baths, and explained the best method of purification. Local authorities are well aware of the recommendations in the report, and my right hon. friend proposes again to call attention to them in the forthcoming annual report of the Ministry.

### Use of Fresh Cream in Ice-cream

Lieut.-Colonel ACLAND-TROYTE asked the Minister of Health whether he would bring in legislation or regulations to ensure that no article must be sold as ice-cream which was not made from fresh cream.—Mr. SHAKESPEARE replied: My right hon. friend has no power to make regulations to the effect suggested, and he could not undertake to introduce legislation to deal solely with this matter. The general question of legislation to enable definitions of articles of food to be prescribed is receiving consideration in connexion with the recommendations of the Departmental Committee on the Composition and Description of Food which has recently reported.

### Fatal Bicycle Accidents to Children

Mr. ANSTRUTHER-GRAY asked the Minister of Transport whether, in view of the large number of fatal bicycle accidents to children under 16, he had considered the need for an age limit under which children must not ride bicycles on the public roads.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Ministry of Transport) replied: The number of bicycle accidents to young people is a matter of great regret, but I think that the adoption of a minimum age limit for cyclists would impose an unjustifiable degree of hardship on a large number of persons.

### Physical Condition of Naval Recruits

Sir ROBERT GOWER asked the First Lord of the Admiralty how many boys and men respectively were accepted in the year 1933 for His Majesty's Navy and Royal Marines respectively; how many were rejected on account of some physical deficiency; and what was the corresponding percentages of rejections to acceptances in the years 1929, 1930, 1931, and 1932 respectively.—Sir BOLTON EYRES-MONSELL replied: The following is a statement showing the number of boys and men entered in the Royal Navy and Royal Marines during the year April 1st, 1933, to March 31st, 1934:—

| | R.N. | R.M. |
|---|---|---|
| Boys .. .. .. | 2607 ..... | 132 |
| Men .. .. .. | 3219 ..... | 402 |

Of 11,645 medically examined, 4524 were rejected on account of some physical deficiency. The corresponding percentages of rejections to acceptances during the years in question were:—

| | | | |
|---|---|---|---|
| 1929–30 .. .. | 40·65 | 1931–32 .. .. | 43·33 |
| 1930–31 .. .. | 40·33 | 1932–33 .. .. | 41·00 |

MONDAY, JUNE 4TH

### Vaccination of Naval Ratings

Mr. GROVES asked the First Lord of the Admiralty whether, in view of the terms of No. 12 of the King's Regulations, Article 1417, relative to vaccination, it was the practice to allow persons to enter the service who were conscientious objectors to vaccination.—Sir B. EYRES-MONSELL replied: No, Sir. All candidates on entry are required to declare their willingness to be vaccinated or revaccinated and inoculated, if necessary, otherwise they are not accepted for entry.

### Fat Content of Tinned Cream

Mr. TEMPLE MORRIS asked the Minister of Health whether he was aware that tinned cream, labelled thick cream but containing only about 20 per cent. of cream, was being sold in different parts of the country; and whether this practice was approved by his department.—Sir HILTON YOUNG replied: I am aware that tinned cream containing about 20 per cent. of milk fat is sometimes labelled as thick cream. The question whether

this is a false description is one for the consideration of the Courts in the event of proceedings being taken under the Food and Drugs (Adulteration) Act. The matter is not one in which I am empowered to take action.

TUESDAY, JUNE 5TH

### Ventilation of the House of Commons

Mr. BERNAYS asked the First Commissioner of Works whether he was satisfied that every possible effort had been made to improve the ventilation of the House of Commons.—Mr. ORMSBY-GORE replied: A very comprehensive engineering report on this subject was presented to Parliament in June, 1931, as Command Paper No. 3871 of that year. This report is available in the sale office. I have recently had analyses made of the air in the chamber and lobbies at different times of the day, and I am sending the hon. Member a copy of the Government Chemist's report. I am further carrying out a similar but more complete survey of the ventilation of the whole building, as a result of which I hope it may be possible for more definite conclusions to be reached.

Mr. BERNAYS asked if it was not the fact that the atmosphere of the House compared very badly with that of any cinemas in the country?

Mr. ORMSBY-GORE said that that was certainly his own impression, but all the scientific and technical experts who had investigated the matter found to the contrary.

### Elimination of Noise from Aeroplanes

Mr. BERNAYS asked the Under-Secretary of State for Air whether he would consider the introduction of legislation making the use of silencers obligatory on privately owned aeroplanes.—Sir P. SASSOON replied: No, Sir. My noble friend is wholly in sympathy with the object in view—namely, the elimination of all avoidable noise in flying; but it would be altogether premature at present, and indeed useless, to make the fitting of silencers legally obligatory. Silencers would diminish the noise from the engine, but would not affect that from the propeller, and they would have the disadvantages at once of impairing the efficiency of the aircraft and of increasing the risk of fire. The whole question is under active consideration and it is hoped that the technical progress which has been and is continuing to be made will have the effect eventually of solving this very difficult problem.

# MEDICAL NEWS

### University of Oxford

The degree of doctor of medicine has been conferred on K. N. Irvine.

### University of London

Prof. G. E. Gask and Mr. H. L. Eason have been appointed governors of the British Post-Graduate Medical School.

Applications for the William Julius Mickle Fellowship should reach the principal of the university not later than Oct. 1st. This fellowship is awarded annually to the man or woman who has done most to advance medical art or science in the preceding five years. Candidates must be graduates of the university and resident in London. Essays for the Paul Philip Reitlinger prize should reach the University not later than Oct. 1st. They should embody the result of some research work on a medical subject carried out by the candidate. Further particulars of both these awards may be had from the academic registrar.

### University of Wales

At recent examinations the following candidates were successful:—

TUBERCULOUS DISEASES DIPLOMA

P. K. Ghosh, M.B. Calcutta; B. K. Pal, M.B. Calcutta; H. K. B. Rustogi, M.B. Lucknow; P. K. Sen, M.D. Berlin; and H. A. Zaki, M.B. Cairo.

### Society of Apothecaries of London

Dr. Marjorie Houghton James has satisfied the examiners for the Mastery of Midwifery.

### King Edward VII. Hospital, Windsor

At the annual meeting of this hospital last week it was stated that the strain of road accidents had compelled the provision of further accommodation. There is pressing need for an eye ward, owing to the great increase in the number of ophthalmic cases urgently requiring treatment. There is a deficiency of about £15,000, and there is still need that £2500 should be found for the new buildings. The result of 25,000 letters of appeal was £2324.

### Fellowship of Medicine and Post-Graduate Medical Association

The next lecture-demonstrations in the series being given by Dr. A. E. Clark-Kennedy at the Medical Society of London, 11, Chandos-street, Cavendish-square, W., will be on œdema and diuretics (Tuesday, June 12th), and renal insufficiency (June 19th). Forthcoming courses include proctology, at St. Mark's Hospital, from June 11th to 16th; medicine, surgery, and the specialties, at the Prince of Wales's Hospital, from June 11th to 23rd and again from June 25th to July 7th; cardiology, at the National Heart Hospital, June 25th to July 7th; diseases of children, at the Children's Clinic, June 25th to July 7th; ophthalmology, at the Central London Ophthalmic Hospital, July 2nd to 7th; and a week-end course in medicine and surgery, at the Metropolitan Hospital, June 30th and July 1st.

### St. Thomas's Hospital Medical School

The prizes of the school will be distributed on Tuesday, June 26th, by the Earl of Derby, in the Governor's Hall of the hospital.

### Tour in the South of France

The medical faculty of Bordeaux and the medical, thermal, and climatic federation of the Pyrenees have arranged their third tour in this region for men of medicine and science. The party will leave Périguex on August 26th, and the itinerary will include Bordeaux, Dax, Biarritz, and Bayonne. Pau will be reached on Sept. 3rd. A short tour (Sept. 3rd–6th) in the Pyrenees has been arranged and Pau will be the starting-point. Further particulars may be had from Dr. M. Faure, at La Malou (Hérault).

### London Hospital Medical College

It is announced that the Queen has consented to open the new students' hostel of this college on Tuesday, July 3rd, at 3.30 P.M. The sum of £15,000 has been collected towards the building, but another £17,000 is required if the hostel is to start free from debt. It stands on hospital ground and the architect is Mr. Edward Maufe. A short article on the project has already appeared in THE LANCET (1932, ii., 1080).

### The late Dr. Bernard Hollander

A meeting will be held in the Essex Hall, Strand, London, on Tuesday next, June 12th, at 7 P.M., when addresses will be delivered in memory of the late Dr. Bernard Hollander. The meeting is organised by the British Phrenological Society, and those attending it will be addressed by Dr. Hubert J. Norman, Mr. J. P. Gilmour, and Mrs. C. Stackpool O'Dell, dealing respectively with Dr. Hollander's work as physician, rationalist, and phrenologist. The chair will be taken by Mr. C. E. Sewell, and admission to the meeting is free, a collection being taken up to defray expenses only.

### Royal Society of Medicine

*Section of Radiology.*—The annual dinner of this section was held on June 1st, Dr. R. S. Paterson, the president, being in the chair. He proposed the health of the guests, coupled with the name of Mr. W. H. Collins. Mr. Collins hoped that nobody would be jealous of the Middlesex Hospital, but always realise that its department of radiology—which they hoped would be the finest in the country—was open to everybody. That hospital was very fortunate in having Dr. Graham Hodgson to run the department. Dr. Robert Hutchison proposed the Section of Radiology. He said he always liked to send his cases to a sympathetic radiologist—one who would let the physician down gently. The section was in a vigorous condition, and represented one of the great advancing lines in medicine. Dr. F. Hernaman-Johnson said that it now had nearly 300 members. He suggested the provision of a presidential robe for each section, Surgery having a gown decorated with knives and coffins, and Radiology showing healing angels.

### A Discussion on Malnutrition

As already announced, Sir Gowland Hopkins will take the chair at a meeting arranged by the Committee Against Malnutrition, which will be held at 8 P.M. on Wednesday next at 34, Red Lion-square, London, W.C. The speakers will include Dr. Stella Churchill, Prof. J. B. S. Haldane, Dr. R. D. Lawrence, and Dr. R. A. Lyster. Tickets may be had from the hon. secretary of the committee at 19c, Eagle-street, W.C.1.

### Payment of Medical Staffs in South Africa

The Orange Free State Provincial Administration is considering the advisability of paying a small salary, or retaining fee, to all doctors at present giving honorary service in the provincial hospitals. During the past year or two the number of free patients in the hospitals has grown steadily, with the result that the honorary physicians have found it very difficult to cope with the cases. The suggestion is made that if the honorary medical staff was remunerated to some extent the hospital managements would have more control and an opportunity of introducing effective organisation regarding poor patients.

### Scottish Medical Golfing Society

This society has just been formed for the benefit of Scottish members of the medical profession in the London area. The president is Dr. Bertram Shires; the vice-presidents, Sir Ashley Mackintosh, Sir Robert Muir, Prof. James Musgrove, Sir Harold Stiles; the hon. treasurer, Dr. Bruce Williamson; and the hon. secretaries, Mr. Norman Fleming and Dr. Burton Yule. Doctors desiring to apply for membership for the above society are requested to communicate with the senior honorary secretary at 92, Harley-street, London, W.1, mentioning club and handicap.

### Medical Reunion in Vienna

A committee of Viennese physicians are making arrangements to hold an informal reunion from July 9th to 15th in Vienna, primarily of medical men who have received the whole or part of their training in that city. Members of the profession who have trained elsewhere will, however, also be welcome. Scientific meetings and discussions will be held and visits will be paid to hospitals; there will also be social meetings and excursions. Special travel and accommodation rates will be offered to doctors and their families attending the reunion. Further particulars may be had from the Austrian Federal Railways, 31, Lower Regent-street, London, W.1.

### Society for the Provision of Birth Control Clinics

On Tuesday next, June 12th, a lecture will be delivered on the theory and practice of contraception at this centre, 153a, East-street, London, S.E.17, by Dr. Gladys Cox. Practitioners and medical students who have completed their gynæcological course are invited to the lecture. Practical demonstrations in technique will also be open to the same audience on Tuesday, June 19th, at 6 P.M. and at 7 P.M., and on Tuesday, June 26th, at the same hours. Those wishing to attend these demonstrations should bring rubber gloves with them, and a fee of 2s. 6d. is charged for admission. Tickets should be applied for in advance at the Walworth Centre of the Society for the Provision of Birth Control Clinics.

### Welfare of the Deaf

Sir Hilton Young, the Minister of Health, received a deputation on May 30th from the National Institute for the Deaf, the Counties Associations for the Deaf, the National College of Teachers of the Deaf, the Council of Church Missioners to the Deaf, and the British Deaf and Dumb Association. The object of the deputation, which was introduced by Lord Charnwood, was to suggest the necessity for legislation to make the welfare of the deaf the duty of local authorities, and to ask for the appointment of an advisory committee on the deaf. The Minister said that he was in full sympathy with the desire of the deputation to promote the welfare of the deaf to the fullest possible extent. He believed, however, that progress was to be sought not in the imposition of compulsory duties on local authorities but in the encouragement of the work of these authorities and of voluntary agencies on the lines proposed in Circular 1337 issued by his department.

### Infants Hospital, Vincent-square

Last week Prince George presided at a dinner at Guildhall in aid of the funds of this hospital. The special appeal produced £10,000. The hospital, it was stated, contains 100 cots, and there are a further 18 at the convalescent home at Burnham; the out-patients' department can deal with 2000 cases a month.

### Cowdray Club and College of Nursing

H.M. the Queen visited the Cowdray Club on June 2nd, and inspected the "room of memory," the club's memorial to Annie Viscountess Cowdray, and two new floors of bedrooms. This is part of the provision, rendered possible by the gift of Lady Cowdray in 1932, which included refronting the whole building and substantially enlarging the College.

### A Memorial at Leeds

On June 1st, at the General Infirmary at Leeds, Lord Moynihan unveiled a portrait of his father-in-law, Mr. T. R. Jessop, who for 20 years served on the active staff of the infirmary. Mr. Jessop, who died in 1903, described himself as the last of the "general consultants," and to the end of his career saw many medical cases in consultation, though it was as a surgeon that he did his outstanding work. He was the first in England to operate successfully for sarcoma of the kidney, and recounted his experience of operations for renal and vesical calculus in the Bradshaw lecture of 1901.

## Medical Diary

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

### SOCIETIES

PADDINGTON MEDICAL SOCIETY.

TUESDAY, June 12th.—9 P.M. (at the Great Western Hotel, Paddington), Dr. W. G. Bendle: The Doctor and His Critics (Presidential Address).

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

THURSDAY, June 14th, and FRIDAY (at the County Hall, Westminster Bridge), Conference on the National Tuberculosis Scheme: the Experience of 21 Years.

### LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, June 12th.—5 P.M., Prof. O. L. V. S. de Wesselow On Arterial Hypertension (last Croonian Lecture).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 11th, to SATURDAY, June 16th.—LONDON LOCK HOSPITAL, 91, Dean-street, W. Afternoon Course in Venereal Disease.—ST. MARK'S HOSPITAL, City-road, E.C. All-day Course in Proctology.—PRINCE OF WALES'S HOSPITAL, Tottenham, N.15. All-day Course in Medicine, Surgery, and the Specialties.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Lecture-demonstration on Œdema and Diuretics by Dr. A. E. Clark-Kennedy, at 2.30 P.M., on Tues.—PANEL OF TEACHERS. Individual clinics in various branches of medicine and surgery are available daily.—Courses of instruction, clinics, &c., arranged by the Fellowship of Medicine, are open only to Members and Associates.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.

WEDNESDAY, June 13th.—4 P.M., Dr. C. E. Lakin: Demonstration of Medical Cases.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Daily, 2 P.M., Medical and Surgical Clinics, Operations.

MONDAY, June 11th.—10 A.M., Medical Wards. Pathological Demonstration. 11 A.M., Surgical Wards. 2 P.M., Gynæcological and Surgical Wards, Eye and Gynæcological Clinics.

TUESDAY.—10 A.M., Medical Wards. 11 A.M., Surgical Wards. 2 P.M., Throat, Nose, and Ear Clinic. 4.15 P.M., Lecture, Mr. Green-Armytage: The Menopause.

WEDNESDAY.—10 A.M., Medical and Children's Wards, Children's Clinic. 2 P.M., Eye Clinic.

THURSDAY.—10 A.M., Neurological and Gynæcological Clinics. 11.30 A.M., Fracture Demonstration. 2 P.M., Eye and Genito-urinary Clinics.

FRIDAY.—10 A.M., Skin Clinic. 12 noon, Lecture on Treatment. 2 P.M., Throat Clinic.

SATURDAY.—10 A.M., Medical and Surgical Wards, Children's and Surgical Clinics. The lectures at 4.15 P.M. are open to all medical practitioners without fee.

CHADWICK PUBLIC LECTURES.

THURSDAY, June 14th.—5.30 P.M. (in the Chelsea Physic Garden, Swan Walk, Chelsea), Mr. E. Augustus Bowles: Simples and Herbals. Illustrated by Living Plants.

UNIVERSITY OF BIRMINGHAM.

TUESDAY, June 12th.—3.30 to 5 P.M. (at the General Hospital), Mr. B. T. Rose: Demonstration of O.P. Surgical Cases.

FRIDAY.—3.30 to 5 P.M. (at the Queen's Hospital), Dr. O. Brenner: Rheumatic Heart Disease.

LEEDS GENERAL INFIRMARY.

TUESDAY, June 12th.—3.30 P.M., Mr. La Touche: Radio-surgical Demonstration.

# Appointments

HART, P. D'ARCY, M.D., M.R.C.P. Lond., has been appointed Assistant Physician to University College Hospital.

Certifying Surgeons under the Factory and Workshop Acts: MALCOLM, F. J., M.B., Ch.B. Aberd. (Kemnay, Aberdeenshire); SHEPHARD, W. H., L.R.C.P. Lond., M.R.C.S. (Tewkesbury, Gloucestershire).

# Vacancies

*For further information refer to the advertisement columns*

*Archway Hospital, Highgate, N.*—Temporary Asst. M.O. At rate of £250.
*Ashton-under-Lyne District Infirmary.*—H.S. At rate of £150.
*Baghdad, Royal College of Medicine.*—Chair of Materia Medica. Salary at rate of I.D. 960 to I.D. 1200 per annum.
*Bath, Royal United Hospital.*—Out-Patient and Cas. O. H.S. Each at rate of £150. Also Hon. Med. Reg.
*Birmingham City Education Committee.*—Asst. School M.O. £500.
*Blackburn Royal Infirmary.*—Res. Cas. O. £150.
*Bristol Eye Hospital.*—Asst. Res. H.S. At rate of £100.
*Bristol General Hospital.*—Sen. Res. M.O. £200. Cas. H.S. At rate of £100. Also Two H.P.'s., Two H.S.'s., Res. Obstet. O., and H.S. to Spec. Depts. Each at rate of £80.
*Bristol Royal Infirmary.*—Hon. Physician, Hon. Asst. Phy., Hon. Reg. to Orthopædic Dept. Also Hon. Anæsthetist.
*Cancer Hospital, Fulham-road, S.W.*—Second Asst. Pathologist. £250.
*Cardiff, University College of South Wales and Monmouthshire.*—Asst. Lecturer in Anatomy. £400. Asst. Lecturer in Physiology. £400. Asst. Lecturer in Histology. £300.
*Connaught Hospital, Walthamstow, E.*—H.S. At rate of £100.
*Delhi, Countess of Dufferin's Fund.*—Three Vacancies for Women's Medical Service for India.
*Durham C.C.*—District Tuber. M.O. £500.
*Edinburgh Royal College of Physicians.*—Kirk Duncannon Fellowship for Medical Research. £150-£200.
*Evelina Hospital for Sick Children, Southwark, S.E.*—H.P. At rate of £120.
*Exeter, Royal Devon and Exeter Hospital.*—H.S. to Ear, Nose, and Throat Dept. At rate of £150.
*Fareham, Hants, Knowle Mental Hospital.*—Third Asst. M.O. £350.
*Glasgow, Lightburn Joint Hospital, Shettleston.*—Res. Physician. £350.
*Great Yarmouth General Hospital.*—H.S. £140.
*Guy's Hospital, London, S.E.*—Ophthalmic Surgeon.
*Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.*—H.S. At rate of £100.
*Hospital for Sick Children, Great Ormond-street, W.C.*—Physician to Skin Department.
*Hospital for Tropical Diseases, Gordon-street, W.C.*—H.P. At rate of £120.
*Hull Royal Infirmary.*—Cas. O. At rate of £150.
*Ilford, King George Hospital.*—Cas. O. At rate of £130.
*Indian Medical Service.*—Commissions.
*Infants Hospital, Vincent-square, Westminster.*—Clin. Asst. to Out-patient Dept.
*King's College Hospital.*—Radium Registrar.
*King's Lynn, West Norfolk and King's Lynn General Hospital.*—H.P. At rate of £125.
*Leeds General Infirmary.*—Hon. Asst. Surgeon.
*L.C.C.*—Radiologist. £1500.
*London Jewish Hospital, Stepney Green, E.*—Hon. Surgeon.
*London University.*—Examinerships.
*Maidstone, West Kent General Hospital.*—H.P. £150.
*Manchester Hospital for Consumption and Diseases of the Throat and Chest.*—Res. Surg. O. for St. Ann's Home. £200.
*Manchester Royal Children's Hospital.*—Asst. Surgeon. £50.
*Manchester Royal Eye Hospital.*—Jun. H.S. £120.
*Mansfield, Notts, Harlow Wood Orthopædic Hospital.*—Two H.S.'s. Each at rate of £175.
*Middlesbrough, North Riding Infirmary.*—H.P. At rate of £125.
*Mile End Hospital, Bancroft-road, E.*—Asst. M.O. £350.
*Ministry of Health.*—Two Medical Officers. Each £833.
*Newcastle-upon-Tyne Hospital for Sick Children.*—Res. Surg. O. £250.
*Northampton General Hospital.*—H.S. to Ear, Nose and Throat Dept. At rate of £150.
*Oldham Royal Infirmary.*—H.S. At rate of £175.
*Plymouth, South Devon and East Cornwall Hospital.*—H.P. and H.S. Each at rate of £120.
*Portsmouth Royal Hospital.*—H.P. and H.S. Each at rate of £130.
*Preston County Mental Hospital, Whittingham.*—Jun. Asst. M.O. £500.
*Preston and County of Lancashire Royal Infirmary.*—H.P. Also Special House Surgeon. Salary in each case £150.
*Princess Elizabeth of York Hospital for Children, Shadwell, E.*—H.P., and H.S. Each at rate of £125.
*Queen Mary's Hospital for the East End, E.*—Cas. O. Also Res. Anæsthetist and H.P. At the rate of £150 and £120 respectively.
*Queen's Hospital for Children, Hackney, E.*—H.P. and Cas. O. Each at rate of £100. Also Surgeon for Ear, Nose, and Throat Dept.
*Reading, Royal Berkshire Hospital.*—H.S. £150.
*Royal Dental Hospital of London, Leicester-square, W.C.*—Hon. Pathologist.
*Royal Masonic Hospital, Ravenscourt Park, W.*—Res. M.O. £300. Also Res. Surg. O. At rate of £250.
*Ryde, Royal Isle of Wight County Hospital.*—Res. H.S. £180.
*St. Leonard's Hospital, Hoxton-street, Shoreditch, N.*—Asst. M.O. £350.
*St. Peter's Hospital for Stone, Henrietta-street, W.C.*—Hon. Clin. Assts. to Out-Patient Dept.
*Salford Royal Hospital.*—Med. Reg. £250. Also H.P. and H.S. Each at rate of £125.
*Sheffield Children's Hospital.*—H.S. Also H.P. Each at rate of £100.
*Smethwick County Borough.*—Asst. M.O.H. and Asst. School M.O. £500.
*Southampton, Royal South Hants and Southampton Hospital.*—H.P., Cas. O., Res. Anæsthetist, and H.S. for Ear, Nose, and Throat Dept. Also H.S. Each at rate of £150.
*Southend-on-Sea General Hospital.*—H.S. At rate of £100.
*Stockport Infirmary.*—H.S. £150.
*Stoke-on-Trent, North Staffordshire Royal Infirmary.*—H.S. At rate of £150. Also Hon. Radiologist.
*Weir Hospital, Grove-road, Balham, S.W.*—Jun. Res. M.O. £150.
*West Bromwich, Hallam Hospital.*—Res. H.P. At rate of £200.
*West London Hospital, Hammersmith-road, W.*—H.P., H.S. and Res. Anæsthetist. Each at rate of £100.
*Willesden General Hospital, N.W.*—Cas. O. and H.S. Each at rate of £100. Also Clin. Assts. to Out-patients' Dept.
*Wolverhampton and Midland Counties Eye Infirmary.*—H.S. £150.
*Wolverhampton Royal Hospital.*—H.S. for Orthopædic and Fracture Dept. At rate of £100.
*Worksop, Victoria Hospital.*—H.S. £170.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons at Bolton North, Lancs; Halesworth, Suffolk; Sheffield West, Yorks; New Cumnock, Ayrshire; and Stratford-on-Avon, Warwick.

# Births, Marriages, and Deaths

## BIRTHS

BASHALL.—On May 31st, the wife of Dr. C. J. Bashall, of Burbage, Wilts, of a son.

BLACKWOOD.—On May 29th, at Penlea, Newcastle-on-Tyne, the wife of Frederick A. Blackwood, F.R.C.S. Edin., of a son.

## MARRIAGES

BRODGEN—GUYER.—On May 28th, at Seascale, Cumberland, George A. Brodgen, M.D., to Grace Elizabeth, widow of John Fisher Guyer.

REES—SHINNER.—On June 2nd, at St. James's Church, Piccadilly, Edward J. Rees, M.R.C.S., L.R.C.P., to Sylvia Mercy, the only daughter of Mr. and Mrs. Ernest George Shinner, of Hill Barn, Purley Downs, Surrey.

STEWARD—READING.—On June 2nd, at Holy Trinity Church, Marylebone, Graham Villiers Steward, L.R.C.P., M.R.C.S., to Margaret Edith, second daughter of Mr. and Mrs. P. G. Reading, of Arran-road, Catford, S.E.

## DEATHS

DIXON.—On June 3rd, at Randolph-gardens, N.W., Captain Alban Dixon, late R.A.M.C., aged 52.

FINUCANE.—On May 31st, at Hurst House, Sedlescombe, Sussex, Morgan Ignatius Finucane, M.R.C.S., L.R.C.P., J.P., Barrister-at-Law, in his 69th year.

KENDRICK.—On May 30th, at St. Medards, Norton-street, Coventry, Captain Horace Herbert Kendrick, M.R.C.S., L.R.C.P., aged 64.

ROBSON.—On June 3rd, at Homefield-road, Chiswick, W., William Waller Constable Robson, M.R.C.S., L.R.C.P. Lond., aged 74.

***N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.***

# NOTES, COMMENTS, AND ABSTRACTS

## JUGGLING WITH FIGURES

IN the *Annales d'hygiène* for March Mr. Auguste Lumière, the biologist, returns to the thesis which, in France at any rate, is becoming more and more associated with his name. While not denying the bacillary origin of tuberculosis, he is convinced that the susceptibility to infection depends chiefly on hereditary qualities. The distribution of tuberculosis in a given area does not, he maintains, depend on infection of one person by another, but on factors which make themselves felt in the distribution of other conditions such as cancer, births, and marriages. Statistics obtained in the town of Lyons seem to him to support his point of view. In the 20-year period 1906–1925, Dr. P. Vigne, this town's medical officer of health, found that as many as 18,121 of the 23,218 houses in Lyons were innocent of any tuberculosis death in the period under review. There were 3963 houses in each of which there had been one tuberculosis death, and 886 in each of which there had been two tuberculosis deaths. The houses with three tuberculosis deaths in each numbered 212, and those with four tuberculosis deaths in each numbered 58. At the bottom of this list there were two houses with seven tuberculosis deaths each, and one house with eight such deaths. Lumière then shows that the distribution of births by houses is remarkably similar. These births, he states, are due only to the play of chance and prove, therefore, that the tuberculosis deaths also are distributed by the same law and are unaffected by hygienic or other conditions. Why it should be assumed that births are distributed by chance it is difficult to see. The birth-rate, it is well known, varies considerably by social status, and therefore the probability of a birth being registered in a house must differ widely from one house to another. In other words this control group cannot possibly be an effective one. Further, the average number of deaths from tuberculosis per house in these data is 0·29 (i.e., 6703 deaths in 23,218 houses); if this figure be used to represent the probability of a case being recorded in a house it can, in fact, be shown by statistical means that the distribution of the cases over the houses is nothing like what would arise by chance. There is in the observations a gross excess of houses containing multiple cases. To presume that the probability is equal for all houses must, of course, be erroneous, for houses must differ in the number, age, sex, and occupation of the inhabitants. But the data provided do not allow a better test to be applied. In his appeal to the laws of chance Lumière appears no more helpful than those whom he condemns for having neglected them. It would, in fact, be interesting to see the distribution by houses of an equal number of cases of a disease that Lumière would accept as infectious—small-pox, for instance. If this should prove similar it would in simple fashion show the fallacy of his method.

## BLOOD-SUGAR AND GLYCOSURIA IN GRAVES'S DISEASE

IN a supplement (1934, No. LIV.) to *Acta Medica Scandinavica*, W. T. Andersen reports urine- and blood-sugar studies in 31 patients with exophthalmic goitre. The diagnosis was based on tachycardia, goitre, and tremor, and exophthalmos was not considered a necessary symptom. In all the patients sugar was discovered in the urine in some specimen passed during the day, though it might not amount to more than a trace. Using a similar technique glycosuria was present in only 20 per cent. of normal controls. The fasting blood-sugar level was usually found normal in the goitre patients, but the blood-sugar curve after glucose by mouth was increased in height and in duration, more especially in the severe cases. The investigation suggested that the threshold for glycosuria was a little below normal. After thyroidectomy the abnormalities in blood- and urine-sugar tend to disappear; thus glycosuria has been found to be no longer present, the renal threshold is a little higher, and sugar-tolerance tests show a fall in what were previously the highest curves. The changes in carbohydrate metabolism are held to be explained best by Falta's theory which supposes that the thyroid secretion interferes with glycogen storage in the liver. This leads to increased demands on pancreatic activity, and in a high proportion of cases the response is apparently inadequate to maintain completely normal conditions.

## LINES FROM A G.P.

WE published recently (THE LANCET, May 19th, p. 1100) some pleasant "Lines *to* a G.P." extracted from the *St. Mary's Hospital Gazette*. Now Dr. F. L. Nicholls, writing from Fulbourn, has sent us some "Lines *from* a G.P." in which the writer sets out the trials of the general practitioner of olden time—the exact date of their writing is unknown. The first ten lines run as follows:—

> "Luckless he, whom hard fates urge on
> To practice as a country surgeon
> To drag a heavy galling chain
> The slave of all for party gain:
> To ride regardless of all weather
> Thru' frost and snow and hail together
> Sometimes to walk when dark as pitch
> And get a tumble in a ditch
> To smile and bow when sick and tired,
> Considered as a servant hired."

In similar vein the author points out the troubles of general practitioners with neurotic patients and those of surly temper or neurotic temper, and dwells on the grave dilemma where two urgent cases, probably obstetric, summon the practitioner simultaneously to different points of the compass. The irritation caused by constant disturbance at meals and by the petty scale of payment are also made the subject of mournful rhyming. Dr. Nicholls says that the lines will arouse memories in those who look back on country practice 50 or 60 years ago, and for that reason sends them for publication. But their principal interest lies in their suggested attribution, for Dr. Nicholls copied the lines from a scrapbook bearing the date 1876 and the name "Dr. E. Jenner" was appended to them. The introducer of vaccination was born in 1749 and died in 1823, but for some years before he died he practised in London. If in the verses from which we quote the opening sentences he was recording personal experiences they would probably have been written about 140 years ago, unless they are reminiscent. There is nothing by which to date their composition, but it is, surely, improbable that Edward Jenner, an accomplished and erudite man, could have been the author.

## MALARIA ACQUIRED IN SYDNEY

MALARIA was made a notifiable disease in New South Wales from March, 1915, to November, 1919. During this period 229 cases were notified, but in only two of them was the infection acquired in the State. Since then a further four indigenous cases have been reported, one of the patients having contracted malaria in Sydney itself. The report of the director-general of public health for New South Wales for the years 1931 and 1932, which has just been issued, contains an account, by Dr. E. L. Morgan, of yet another case of the disease acquired in Sydney. The patient, a girl aged 9 years, was born in Sydney and had never been out of the city. No member of the family of ten was suffering from malaria or had ever been in malarial districts. She was admitted to the Royal Alexandra Hospital for Children in January, 1931, suffering from abdominal pain and frequent rigors, and blood examination showed the presence of numerous benign tertian parasites (*Plasmodium vivax*). Anopheline mosquitoes are known to exist in the vicinity, and it is thought that the infection was carried from some southern Europeans or Asiatics, of whom a small number live in the suburb from which the child comes.